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PHOTOGRAPHIC INTERPRETATION REPORT

TYURA TAM MISSILE TEST CENTER, USSR

NPIC/R-1440/63
September 1963

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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LIST OF ILLUSTRATIONS

INTRODUCTION

The Tyura Tam Missile Test Center (TTMTC), located at 45-55N 63-18E (Figure 1), was covered by photography [redacted] 25X1

25X1 [redacted] The test center is situated in an area that permits considerable expansion of facilities. In fact, during the interval between the first and last coverage, the Soviets began to expand the center, particularly the launch facilities. [redacted] 25X1

25X1 one launch complex and the Support Base were the only components of the TTMTC. By [redacted] construction had begun on a second launch complex, and most of the facilities under construction at the time of the earlier coverage had been completed. The photography [redacted] revealed that a third launch complex was under construction. Heavy cloud cover, however, precluded determining the status of the first two launch complexes. 25X1

The direction of fire of the TTMTC apparently is to the northeast, and the impact area apparently is on the Kamchatka Peninsula, about 3,400 nautical miles (nm) to the northeast. Some of the downrange instrumentation facilities were covered by the photography [redacted] 25X1 and the probable terminal range instrumentation facilities were covered by photog- [redacted] 25X1 25X1

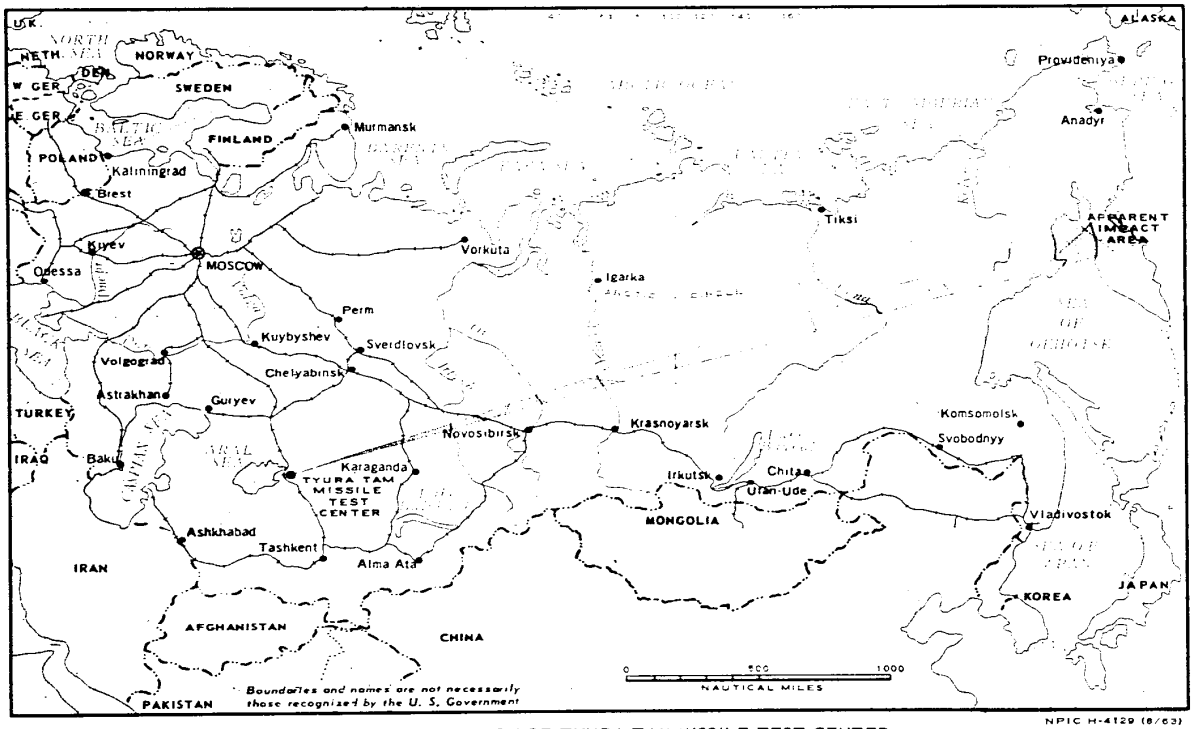

FIGURE 1. LOCATION OF TYURA TAM MISSILE TEST CENTER.

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RANGEHEAD

The launch facilities of the TTMTC and their immediate support facilities are located generally north of the village of Tyura Tam. [redacted] they consisted of three launch complexes in various stages of construction (Figure 2). Launch Complex A, together with its immediate support facilities, is located at 45-55N 63-18E. Launch Complex B is located at 46-01N 63-33E. Launch Complex C, which was in an early stage of construction, is located at 45-58N 63-39E.

Other support facilities that service the entire TTMTC are located along the main road and rail spur that serve the launch complexes and south of the village of Tyura Tam.

LAUNCH COMPLEX A

Launch Complex A consists of a launch area and a launch support area. Analysis of the photography of the complex reveals that all facilities probably were complete at the time of the [redacted] coverage, indicating that launching and static firing could have been conducted at that time and for a limited period before then.

25X1

Launch Area

The launch area of Complex A (Figure 3) is enclosed by two parallel security fences situated 160 feet apart and measures 2,925 by 1,625 feet. Just inside the outer fence and parallel to it is a series of light poles spaced 120 feet apart, probably used for night security. Guard towers are located at the four corners of the launch area and at intervals along the fence. A security building is situated near the rail and road entrances to the area.

The single-track rail line that serves the launch area approaches the launch structure on a manmade embankment [redacted] high and branches into five separate spur lines, four of which terminate on the launch structure. The fifth spur leads into a building adjacent to the launch platform. Several major drainage ditches crisscross the launch area.

25X1

At the eastern end of the launch area is a pear-shaped pit that measures 880 by 550 feet, the long axis of which is oriented east-west. The pit (Figures 4 and 5) is excavated along two terraced levels and at its deepest point is [redacted] below the launch platform. The lower terrace is [redacted] above the bottom of the pit. The upper terrace is [redacted] above the lower terrace and [redacted] below the launch platform.

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A ramp enters the pit from the eastern end and terminates at the foot of the launch structure. This ramp provides access to the pit for maintenance of the pit and the launch structure.

Some of the earth excavated from the pit has been piled about 800 feet to the northeast, within the fenced launch area. The remainder may have been used to construct the rail embankment.

At least nine instrumentation and observation positions can be identified around the rim of the pit (Figure 3). These positions face toward the launch structure and generally are earth covered. Six of the positions are relatively small and probably house cameras and instruments. The remaining three are large observation bunkers. The largest of the three is served by a covered personnel passageway

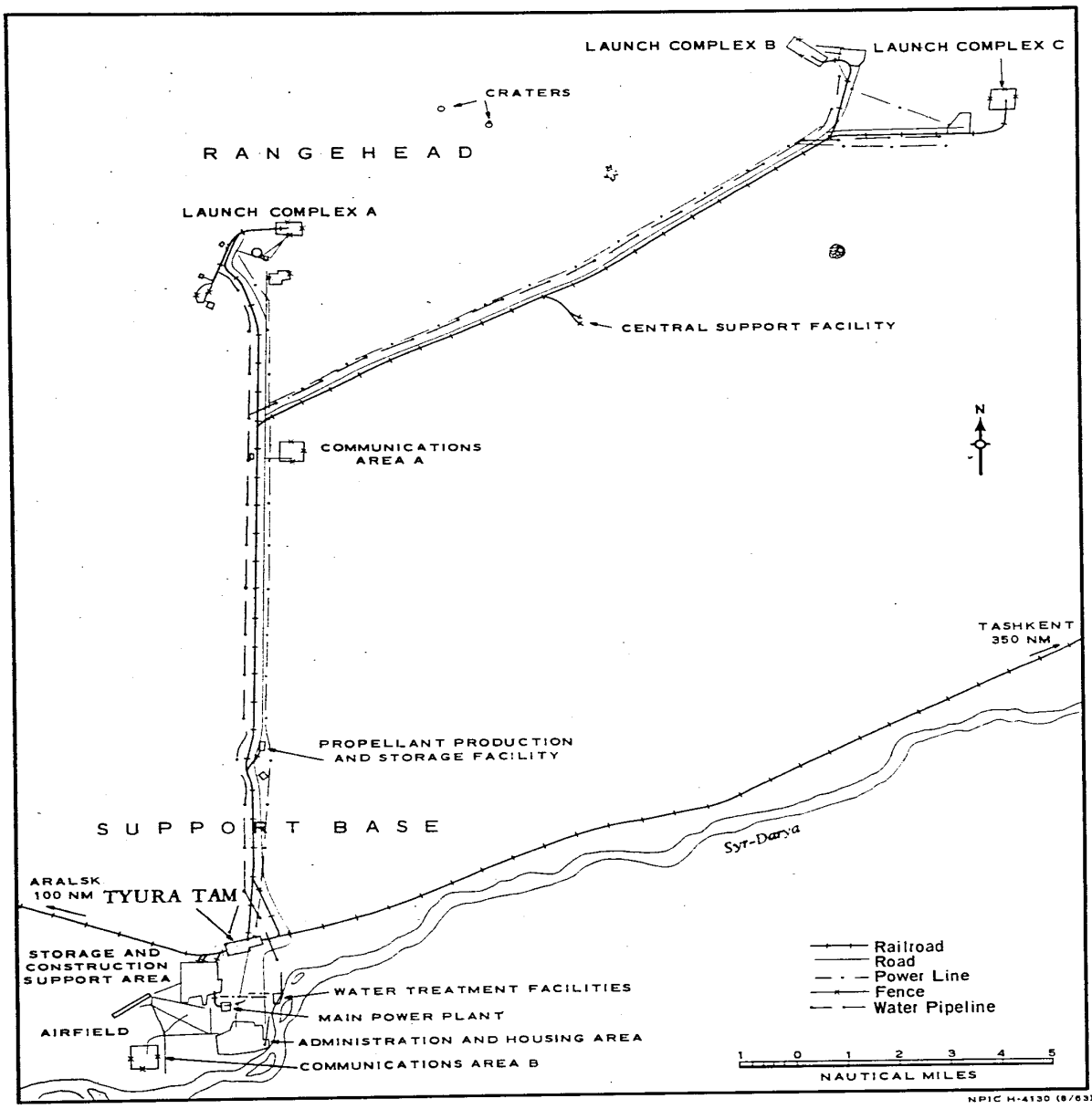

FIGURE 2. TYURA TAM MISSILE TEST CENTER.

from the road and is located along the rim of the pit at a point 300 feet south of the launch structure. One of the other two large observation positions is a long bunker situated southeast of the launch structure, and the third is located at the eastern end of the pit. These positions provide ample close-in instrumentation to support firings at this launch area.

The concrete launch platform (Figures 4 and 5), which overhangs the western end of the pit, measures 135 feet square and is [redacted] above the bottom of the pit. The launch platform is supported by four concrete piers 30 feet wide that are spaced approximately 55 feet apart. The platform itself appears to be about 10 feet thick.

25X1

At the bottom of the pit is a concrete structure that extends 135 feet beyond the launch platform. At the forward end and forming a part of the concrete structure is a sump measuring 110 by 75 feet.

25X1

[redacted]

At the end of the trenches nearest the launch structure are two objects that may be sluiceways, possibly used for propellant dumping. The face of the sump closest to the launch structure is at least 10 feet tall. It is therefore probable that a flame deflector is located under the launch structure at a higher level than the top of the sump.

A number of objects are located on the launch platform, many of which cannot be identified on the photography, because they are obscured by shadows or are located in the darkened areas. The most prominent objects on the launch platform are the service tower, located near the center of the platform, and the two 110-foot-high unidentified towers located at opposite corners of the platform.

The launch platform is enclosed by a perimeter fence or wall and is served by four rail spurs. One of the rail spurs leads into the darkened area in the center of the platform. A second spur leads onto the southern side of the platform. The third spur, which is centered between the other two, terminates just beyond the edge of the platform, and the fourth spur serves the northern part of the platform.

A pair of rails [redacted] apart, which may be a gantry-crane track, straddles the rail spur that leads into the darkened area of the platform. The service tower, which is situated over the darkened area in the approximate center of the platform, is [redacted] high and widens from [redacted] at the top to a width sufficient to allow it to travel on the gantry track. The base of the tower, including the supporting struts, measures 75 feet across. The four corner struts that support the tower probably are not straight but extend vertically from points approximately [redacted] from the center of the tower to a height of 25 to 30 feet, then bend sharply to meet the tower approximately halfway up. This configuration may facilitate the movement of equipment in the vicinity of the tower base.

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One of the two 110-foot-high unidentified towers on the launch platform is located on the northeast corner on a lip that extends 10 feet out over the pit. The other tower is located on the southwest corner of the platform. These towers have an array on top that is at least 5 feet wide and 10 feet high.

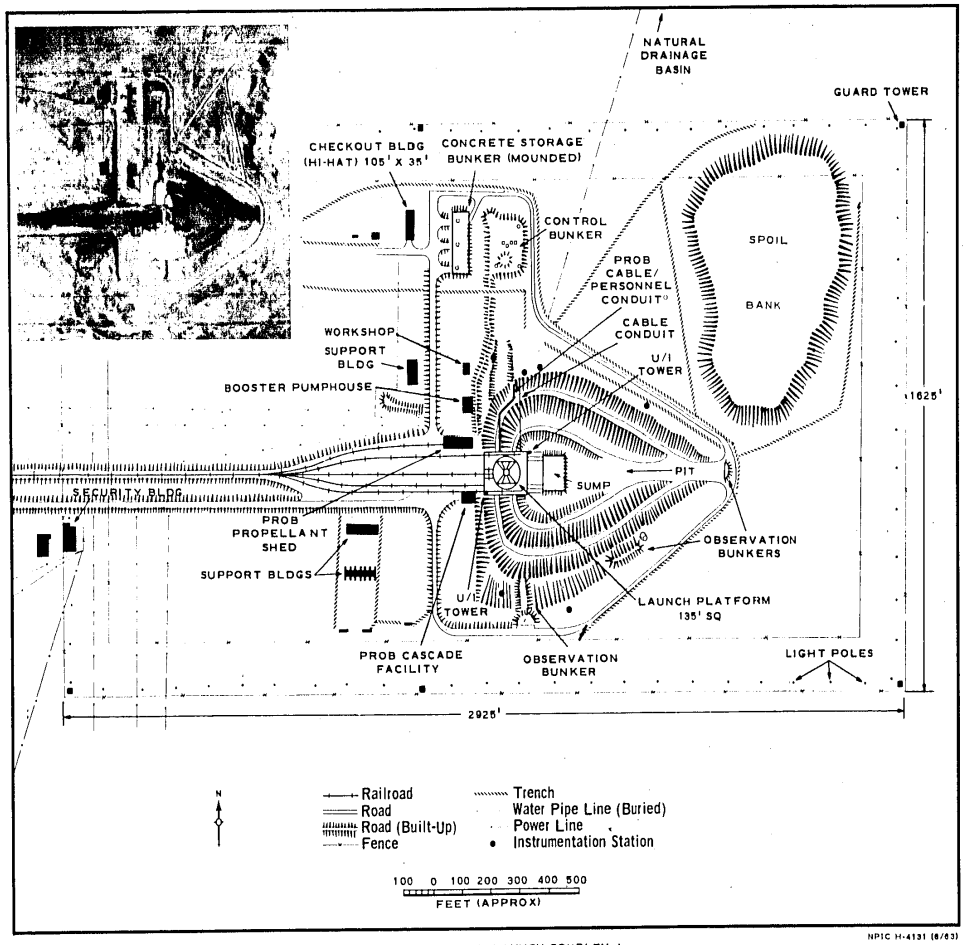
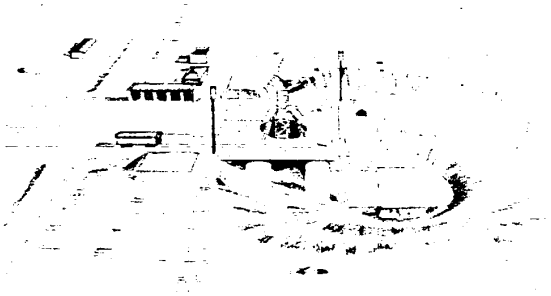


FIGURE 3. LAUNCH AREA, LAUNCH COMPLEX A.



NPIC H-4132 (8/63)

FIGURE 4. CONCEPT OF LAUNCH STRUCTURE, LAUNCH COMPLEX A.

A line drawn between the two unidentified towers on the platform bisects the service tower, and an extension of the line to the southwest bisects a large interferometer-type instrumentation site located in the support area. An extension of this line to the northeast suggests the probable azimuth of fire and the alignment of the test range.

Immediately northwest of the launch platform is a flat-roofed rectangular probable propellant shed [redacted] The shed is open at least on the north side, where there are six supports equally spaced at [redacted] intervals. The east end of the shed is protected by an earth embankment, although this would not provide adequate protection from an explosion on the nearby launch platform. The shed could be used as an immediate storage point for rail cars carrying propellant because of the rail line that enters it. The propellant loading or topping of an erected missile could be accomplished from this point by the use of underground piping. The shed probably is not used as a missile-hold or temporary storage facility.

Between the [redacted] coverages, a probable cascade facility was built near the southwest corner of the launch platform. This facility measures 55 by 40 feet and is positioned approximately 135 feet from the service tower.

The control bunker for the launch area is located approximately 600 feet north of the launch platform (Figure 3). This structure, which is earth covered, measures 145 by 110 feet, and its top is [redacted] below the level of the launch platform. Ground has been cleared between the bunker and the launch platform to provide line of sight, and, [redacted] the two were connected by a cable tray that extended about 200 feet across the open pit. The bunker is in line with the service tower and appears to have some instruments or objects, possibly periscopes, on its roof. [redacted] an additional object or vent was located at each corner of the bunker, but [redacted] that at the northwest corner had been removed. The northwest corner has also been identified as the probable personnel entrance for the bunker. In [redacted] a new probable cable conduit and passageway had been constructed. This new conduit apparently parallels the old cable tray to the point out over the pit. At that point the new conduit turns and follows the approximate line of the upper terrace to the point where it joins the launch structure. The point at which it joins the launch structure is approximately 80 feet above the base of the pit and about 60 feet below the level of the platform. The new conduit is supported by several small vertical pillars, whereas the old tray was unsupported. A possible covered personnel passageway or cable line also leads from the bunker southward to the rail embankment near the probable propellant shed.

[redacted]

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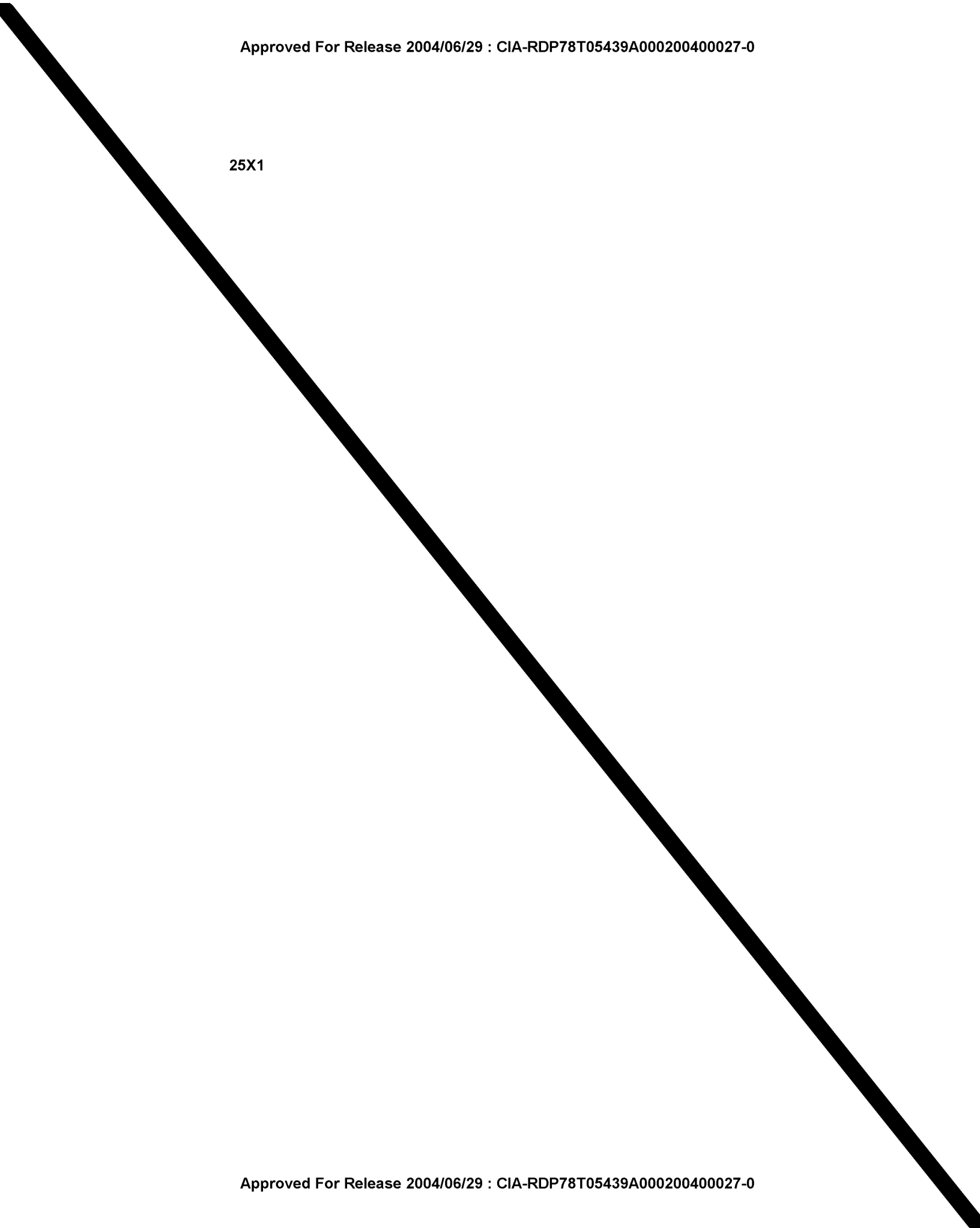

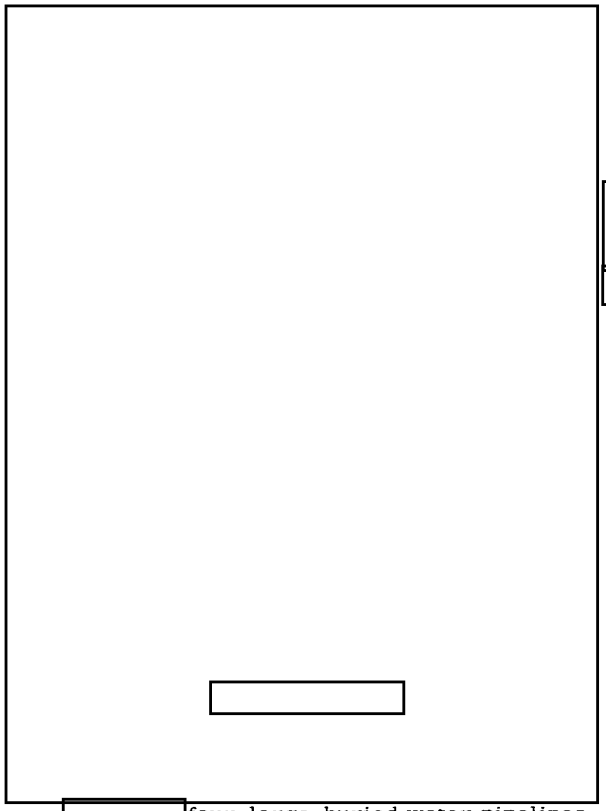

25X1

four large buried water pipelines served the launch area. The three largest lead from Water Storage Tank Area A in the support area and enter the launch area from the south. The lines pass under the rail line and then extend eastward through the booster pumphouse and probably to the launch structure. The fourth line enters the area from the west and parallels the other lines to the booster pumphouse. This line probably provides the normal daily water requirements and the other three lines provide water for firings. It is estimated that the three lines could provide up to 4 million gallons of water during operational periods. A probable covered pipeline, added extends northwest from the north side of the rail embankment near the probable propellant shed. The line runs under the road and then continues as an open ditch to an open pit 15 feet square situated 90 feet southwest of the new support building.

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There are three separate drainage systems, the largest of which is a covered line which leads from a point near the pit 1,360 feet north to a natural drainage basin outside the fence line. This basin has a large darkened center, indicating that some liquids were probably drained into it before The second system, utilizing open ditches, rims the pit and leads northward to the fence line behind the control bunker, and then westward to the large manmade drainage basin west of the building. Another line in this system, previously discussed, leads into this basin from a point near the road terminus near the building. The third and smallest drainage system, also utilizing open ditches, begins at a point between the control bunker and the launch structure, and leads 1,230 feet westward to a possible fuel burn-off pit.

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The two open-ditch drainage systems are located within the fenced section of the launch area, and it is probable that they are enclosed for necessary "cooling off" or safety purposes. The largest system, which empties into the natural basin outside and north of the fence line, is probably for the large amounts of uncontaminated or treated water pumped from the pit after a firing.

Power for the launch area is transmitted through either of two facilities. The primary supply probably is transmitted through two secondary power lines which follow the rail

line north and east toward the launch area. Although the trace of these lines, which may also serve as light poles, is lost in shadow just after they swing eastward, they probably continue, either aboveground or underground, to the launch area. Less likely is the other possibility that power is transmitted from the power substation to the launch area through buried cable lines. If so, these lines might be used for power transmission in the event of the failure or destruction of aboveground facilities. Earth scar and ground clutter preclude determination of the power-distribution system within the launch area.

Although no major radio communications facilities are visible in the launch area, a probable wire communications system serves the area and connects with other key facilities in the rangehead. This system consists of a buried cable line which originates at Communications Area A, leads to the launch support area, then to the Instrumentation Control Center, and finally terminates in the launch area. Earth scarring precludes tracing this line within the launch area.

In the immediate downrange direction from Complex A, four craters are visible on the [redacted] One of the craters was present [redacted] None shows evidence of burn scarring. The craters are 3.5 to 4.5 nm from the launch area and range in width from 30 to 75 feet. Trails from the vicinity of the launch area extend to the craters.

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Launch Support Area

The launch support area for Launch Complex A extends for about 2 nm along the rail spur that serves the complex (Figure 6). The area contains various operational, technical, and service facilities. [redacted] various additions were made within the area. (The Instrumentation Control Center, which is located within the launch support area but which may serve the entire TTMTC, is discussed in the section on instrumentation facilities.)

25X1

Operational Facilities. The major items in this group are two missile assembly and checkout facilities. Each is fenced and contains a large rail-through assembly and checkout building. In addition, each appears to have similar associated water, waste-disposal, and steam- or heat-producing facilities.

Missile Assembly and Checkout Facility No 1, the more northerly of the two, is located in a fenced area (770 by 545 feet) adjacent to the rail spur leading to the launch area. Except for the addition of two storage or shop-type buildings and two small unidentified buildings, this facility did not change significantly [redacted] A four-track siding off the main rail spur serves the area. Three of the tracks pass through the assembly and checkout building and the fourth passes to the east of the building (Figure 7) This building measures 395 by 105 feet and 70 feet high. Several support and shop-type buildings, including a security building [redacted] are located in the southern and eastern parts of the facility. A tall tower [redacted] is located in the southeastern corner of the facility and apparently is connected with Water Storage Tank Area A (not shown).

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Of the two storage or shop-type buildings added to the facility, one, a gable-roofed building, measures 125 by 35 feet and is located to the northeast of the rail-through building. The other, a hip-roofed building, measures 160 by 55 feet and is located parallel to and on the west side of the rail-through building.

Missile Assembly and Checkout Facility No 2 is located at the southern end of the support area. Just north of it is an explosives

25X1

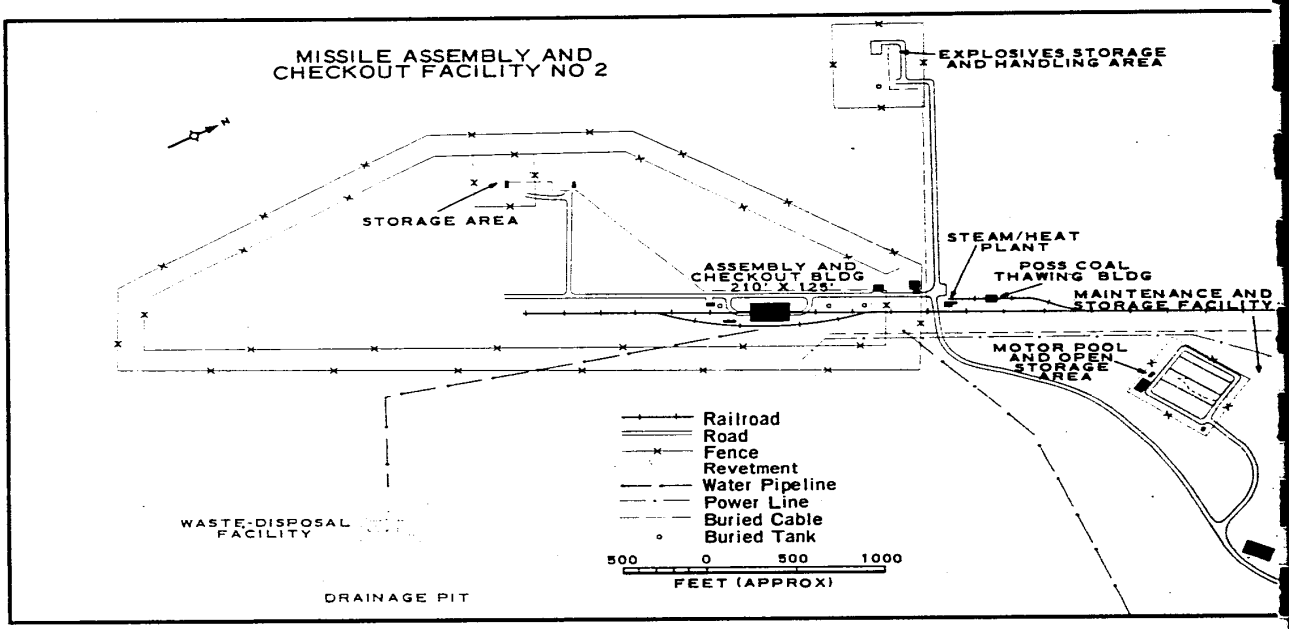

FIGURE 6. LAUNCH SUPPORT AREA,

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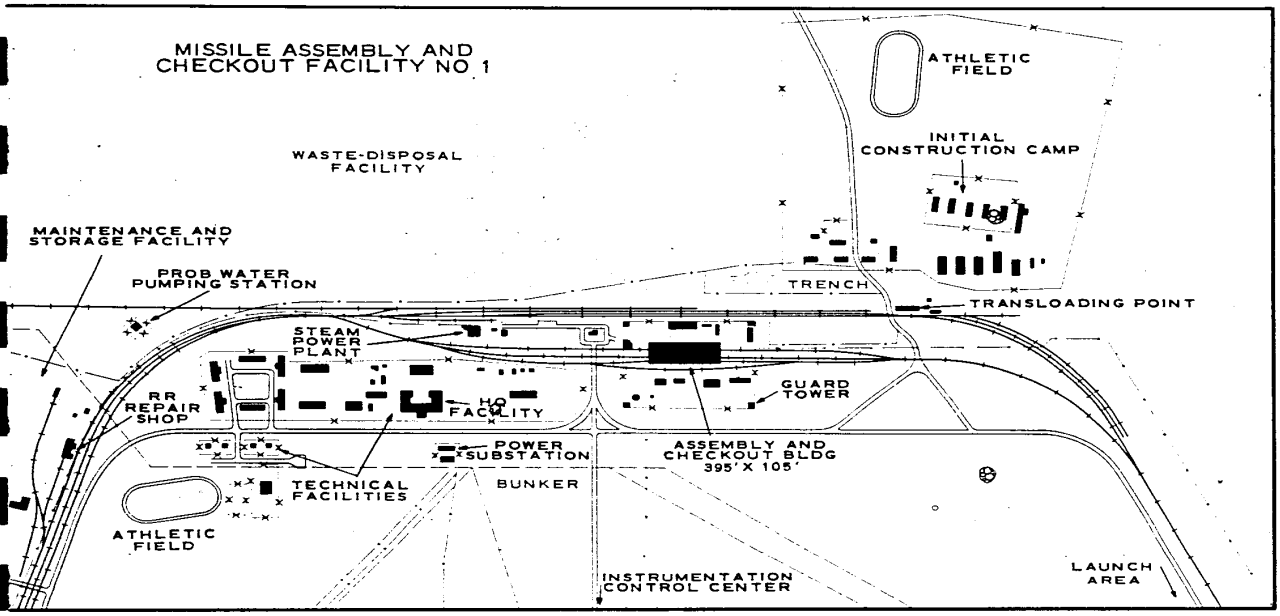

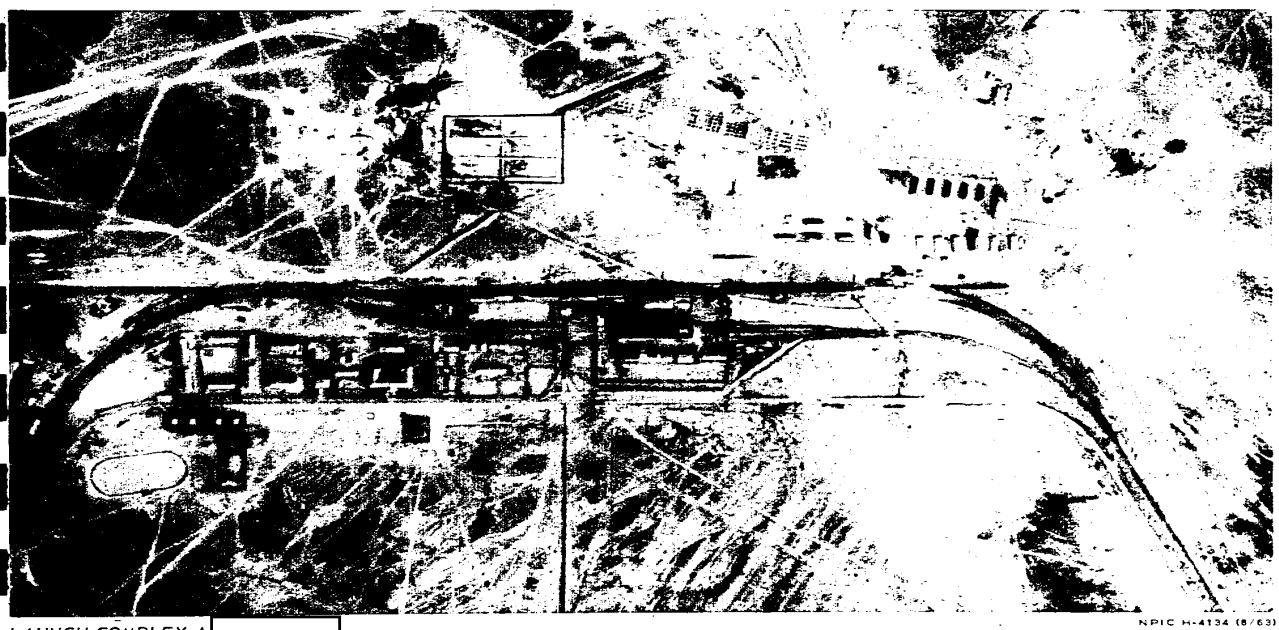

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LAUNCH COMPLEX A

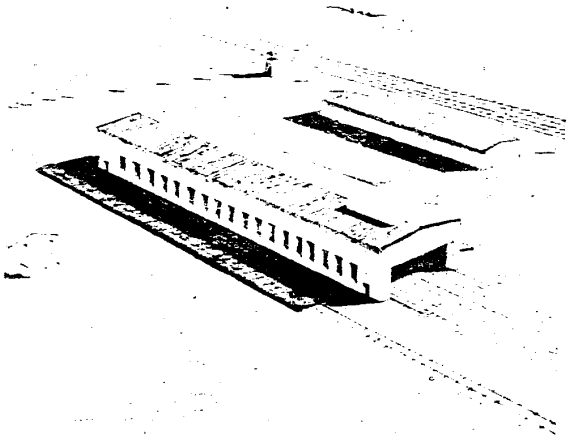

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FIGURE 7. CONCEPT OF RAIL-THROUGH BUILDING AT FACILITY NO 1.

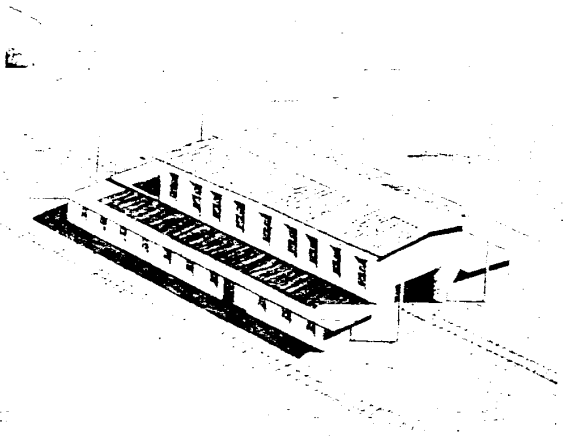

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FIGURE 8. CONCEPT OF ROAD- AND RAIL-THROUGH BUILDING AT FACILITY NO 2.

storage and handling area which appears to be associated in some manner with the checkout facility. The assembly and checkout facility measures 4,400 by 1,500 feet overall and narrows to 520 feet at either end. It is double fenced. The single rail line that serves the facility passes through the assembly and checkout building and a siding bypasses the building on the east side (Figure 8). The siding rejoins the rail line south of the building. This building, the only large structure in the facility, measures 210 by 125 feet and has a monitor 175 by 60 feet on its northern end. Its overall height is approximately 70 feet.

25X1

The road serving the facility was surfaced [redacted] The main road parallels the assembly and checkout building on the west and continues to a storage area approximately 1,400 feet southwest of the building. A loop road off the main road passes through the building. The road on each end of the building has [redacted]

25X1

[redacted] The center area of the road on the north end is paved with a dark material which has the appearance of asphalt. On each end of the building are two masts or poles, which function as lightning rods or as safety guide poles for rail- or truck-transported loads which enter or leave the building. These poles are equidistant on either side of the road and rail line that pass through the building and are [redacted] 25X1

[redacted] 20 feet from the building. A probable cooling tower, 10 feet square, is located approximately 80 feet southwest of the building. [redacted] a circular excavation was present at this point. Three small revetments were constructed [redacted] between the security fences approximately 200 feet west-northwest of the large building.

25X1

25X1

Just south of the drive-through building are two support-type buildings, one of which was built [redacted] The older building, located west of the rail line, measures [redacted] The other building, located between the rail line and the siding, measures 50 by 25 feet. Three storage tanks [redacted] in diameter, two north and one south of the drive-through building, were covered with earth

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25X1

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25X1

25X1

A probable security building, is located west of the rail line as it enters the area. A water pipeline connecting Assembly and Checkout Facility No 2 with Water Storage Tank Area A was also completed between 25X1

The explosives storage and handling area is fenced and is served by a concrete road It contains a large, road-served, revetted concrete pad and a bunker or covered tank A small building, had been removed The concrete pad, which measures 80 by 65 feet, is enclosed on three sides by an earthen revetment.

Also associated with Assembly and Checkout Facility No 2 is a six-bed waste-disposal facility, located at the terminus of a drainage line that originates near the drive-through building.

Technical Facilities. These facilities support the technical activities at the launch complex. They consist of a group of centrally located, road-served fenced compounds which cover approximately 20 acres. These compounds contain at least 30 buildings of various sizes, the arrangement of which indicates a well-planned layout. Included, in addition to housing for technical personnel, are headquarters and laboratory facilities and an unidentified technical facility. the general area was clean and appeared complete, although there was room for expansion.

The housing includes five gable-roofed buildings. Four and are paired off and fenced. The fifth is 85 by 55 feet and enclosed by a fence 315 by 140 feet. This larger building is possibly the residence of the rangehead administrator, since the area is well kept and appears to be landscaped. An athletic field 540 by 245 feet is just south of the building.

Other housing includes 2 hip-roofed barracks measuring 150 by 45 feet, 6 gable-roofed barracks which average 150 by 45 feet, and one hip-roofed building 25X1

The headquarters and laboratory facilities consist of a large C-shaped building 25X1 a gable-roofed building 25X1 a gable-roofed building 25X1 120 by 45 feet, a smaller building 35 by 15 feet, and five other structures of various sizes.

The unidentified technical facility consists of a gable-roofed building 160 by 55 feet, a gable-roofed building and five smaller various-sized structures. 25X1

Service Facilities. These facilities are those that actually provide service for the operational and technical facilities in the support area. They include a rail transloading point, an initial construction camp, a maintenance and storage facility, a personnel housing and storage area, a vehicle park, and waste-disposal and power facilities.

The rail transloading point is located about 1,400 feet north of Assembly and Checkout Facility No 1. it consisted of a structure with an inclined conveyer, a transloading building and several small structures. the tall structure and conveyer had been removed, and a new conveyer had been added to one of the small buildings northwest of the transloading building. 25X1

In the extreme northwest part of the support area is the initial construction camp. earth scars and hundreds of former tent bases were visible from earlier occupancy. The only permanent structures in the camp were located near the rail spur. the area had 25X1

been fenced and encompassed about 60 acres. The addition of fencing and an athletic field indicated that the camp was still in use. At least 25 structures of various sizes were present in the camp

25X1

The maintenance and storage facility, located generally between the two assembly and checkout facilities, is contained within a somewhat triangular area, encompassing about 55 acres, bounded on two sides by rail tracks and on the third side by a hard-surfaced road. The facility contains a railroad car repair shop, a coal-storage yard, a probable water-pumping station, a combined motor pool and open-storage area, and a possible vehicle-maintenance area.

The combined motor pool and open-storage area, fenced and measuring 500 by 400 feet, is near the center of the triangular area. It has three associated buildings. One under construction is 90 by 55 feet, one is 40 by 20 feet, and the third is 35 by 20 feet. This area is served by a graded road which curves to connect with the hard-surfaced road to the east.

The possible vehicle-maintenance area, containing a large building 180 by 70 feet, is near the easternmost corner of the triangular area. The roof of the building is gabled at a very slight pitch and is separated by what appears to be three firewall projections across the width of the building. The roof is well vented.

25X1

A structure 15 feet square and approximately 20 feet tall is located 35 feet from the southern end of the building. The top of the structure appears to be open. Its relation to the building has not been determined.

West of the large building and near its north end is a rectangularly shaped stockpile measuring 210 by 20 feet. The pile arches and is 25 feet tall at its highest point. The contents of the stockpile could not be identified. An L-shaped gable-roofed building is located 280 feet west of the large building.

The personnel housing and storage area (not shown in Figure 6) is southeast of the technical facilities. The area encompasses about 137 acres and contains numerous barracks-type buildings, earth-covered bunkers or prefabricated storage buildings, and warehouse-type buildings, in addition to motor pool and maintenance facilities.

The vehicle park (not shown), which is fenced and measures 525 by 340 feet, is about 600 feet southeast of the Instrumentation Control Center. The park contains five buildings, three of which probably are vehicle sheds, and two earth mounds.

Two waste-disposal facilities serve the support area. One, near Missile Assembly and Checkout Facility No 1, consists of six treatment beds with an overall measurement of 650 by 450 feet. A ditch 600 feet long and 35 feet wide extends northward from the perimeter ditch of the disposal facility.

The second disposal facility, located at the end of a water pipeline, is associated with Missile Assembly and Checkout Facility No 2. It consists of six treatment beds having overall dimensions of 350 by 270 feet. A ditch 860 feet long leads south from the disposal facility to a drainage pit 150 feet square.

25X

The power facilities at the launch support area consist of a substation, a steam/heat plant, and a steam/power plant. The substation, which receives power from the main power plant and distributes it by overhead lines and buried cables, is fenced. The steam/heat plant is

located near the entrance to Missile Assembly and Checkout Facility No 2. It [redacted] has a pile of coal near it, and is served by a short rail siding over which is located a possible thawing building, 100 by 25 feet. Although no pipelines are visible between this plant and the large drive-through building, it is believed that this plant provides either steam or heat to the large building.

The steam/power plant may serve the large drive-through building at Missile Assembly and Checkout Facility No 1 in a similar manner, as well as providing a standby source of power.

25X1

LAUNCH COMPLEX B

Construction of this complex was in an early stage when it was first identified in [redacted] (Figure 9). The complex is located approximately 15 nm northeast of Launch Complex A and is served by a single-track rail line that branches from the line that serves Complex A. Paralleling the rail line is a roadway 25 feet wide [redacted] a power line, and a ditch 5 feet wide, probably for a water line.

25X1

25X1

Launch Area

The launch area contains a large pit, a launch structure, an excavation for a control bunker, a tanklike structure, a checkout building, and several miscellaneous features in varying stages of construction (Figure 10). [redacted] the launch area was enclosed by a single fence, except along the northeast side. The fenced area is rectangular, measures 4,400 by 1,325 feet, and covers about 135 acres. No guard towers or a security building are evident. The rail line enters the area at the southeast end and terminates near the checkout building, which was under construction [redacted] The rail line probably was to be extended to the launch structure. The ditch for the water line terminates at a point on the rail embankment outside the fenced area. No communications facilities, land lines, or buried cables can be identified.

25X1

The pit measures about 600 by 525 feet and is oriented along a northwest-southeast axis. It is estimated that at its lowest point the pit is about 100 feet below ground level. No terraces, such as those at Complex A, have been made. A construction road enters the pit from the northwest edge and leads to the base of the pit where the launch structure was being constructed. Three large spoil piles are located in the immediate vicinity of the pit. Much of the spoil probably came from the pit, but some is the result of additional excavation in the launch area. A conveyer appeared to be in use on the northeast end of the pit, leading from the pit through a cut in the edge to a large spoil pile. One or two cuts or roadways in the edge of the pit may have been similarly used.

[redacted] the launch structure was under construction near the southeast end of the pit.

25X1

25X1

[redacted]

The vertical members, only the front two of which are visible, are either concrete pillars or forms for concrete pillars and measure 25 feet square and 65 feet high. The horizontal members, only two of which are visible, are about 15 feet wide and intersect the vertical members about 45 feet above the base of the pit.

A 175-foot-square excavation for a control bunker is located about 425 feet southwest of the launch structure and directly opposite the approximate center of the structure. A large, dark, unidentified area about 50 by 45 feet is located on the bottom and near the forward wall of the excavation. There are no visible

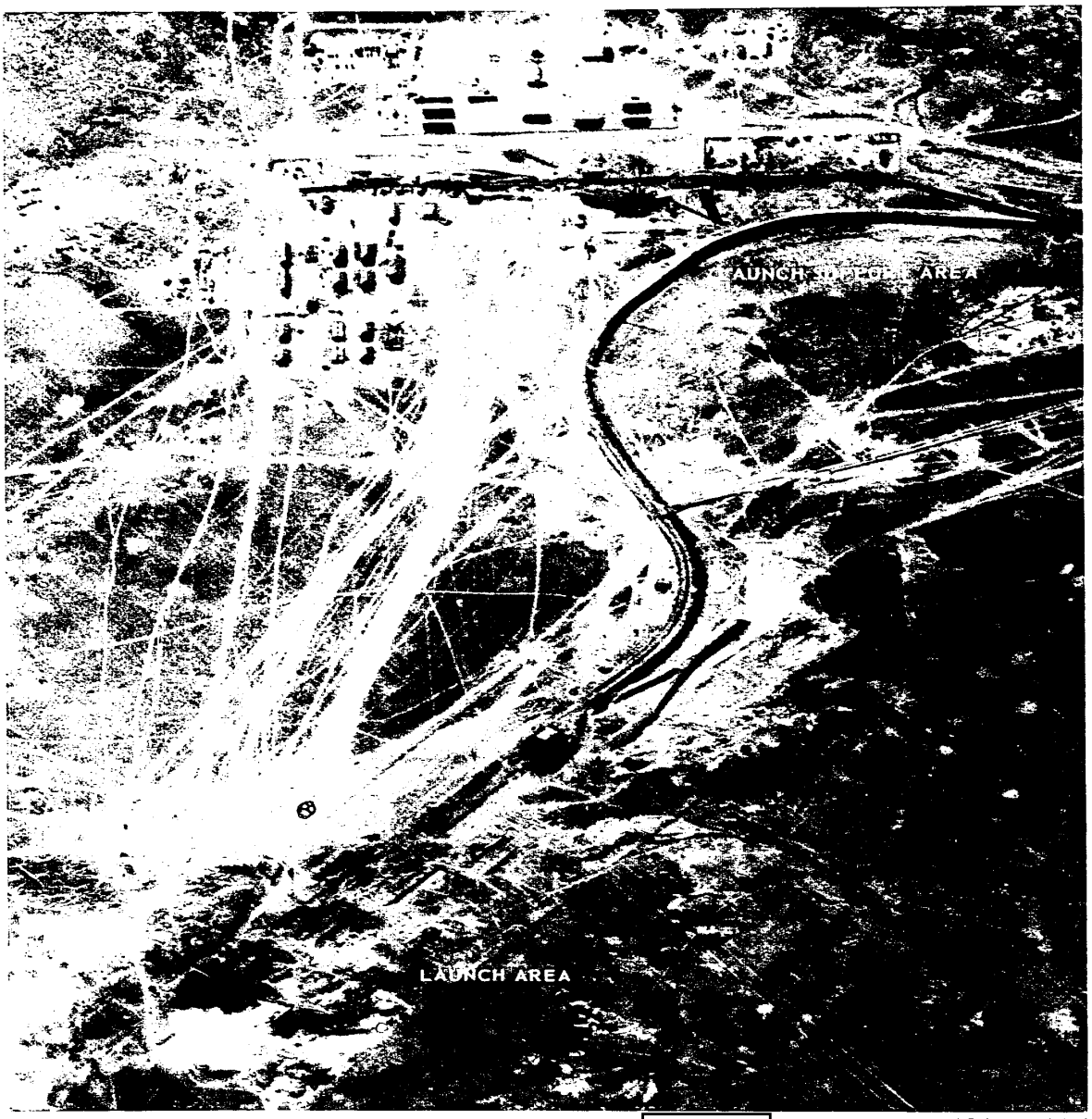

FIGURE 9. LAUNCH COMPLEX B

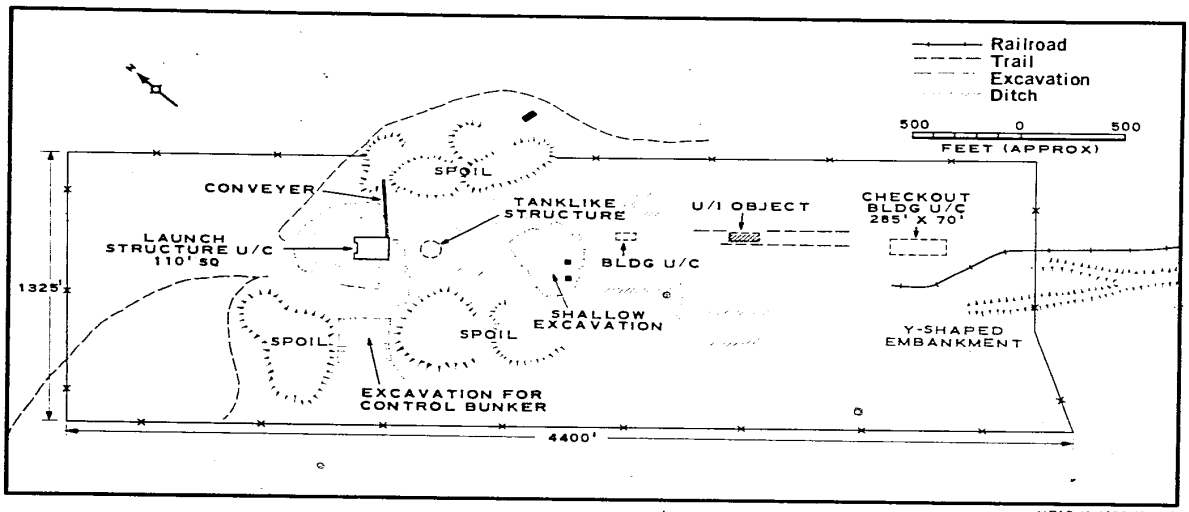

FIGURE 10. LAUNCH AREA, LAUNCH COMPLEX B.

signs of any connection between the excavation and the pit or launch structure. The depth of the excavation cannot be accurately measured.

A large, circular, reinforced, tanklike structure, approximately 85 feet in diameter and under construction, is located 250 feet to the rear of the launch structure. It is situated in an excavated area about 200 feet square. The top of the structure, which is estimated to be 25 feet high, is about at ground level. The heavy reinforcing which appears to surround it could indicate that eventually it will be buried, and, because it is in line with the launch structure and the checkout building, lie beneath the projected rail line.

The checkout building, which measures 285 by 70 feet and 75 feet high, is located about 2,200 feet to the rear of the launch structure. It is roofed for 110 feet of its length, and vertical supports are emplaced for the rest of the building. The rail line has not yet entered the building, but veers to the southwest side and terminates.

Miscellaneous items located in and around the launch area include a Y-shaped earth embankment, a shallow excavation, and several long, linear ground scars. The embankment is near the checkout building at the southeast end of the launch area. Its overall length is 1,100 feet. The launch-area fence intersects the embankment, and most of it falls outside the fenced area. The function of the embankment is not known.

The shallow excavation is irregular in shape and located between the tanklike structure and the checkout building. There is no indication of its function or ultimate configuration. If the rail line is extended to the launch structure, the excavation will lie beneath the tracks. A shed-type building, 100 by 35 feet, is located near the excavation. Several long, dark, linear ground scars or ditches are also located between the tanklike structure and the checkout building. A large, dark, unidentified object is located along the longest scar.

No guidance or instrumentation facilities

have been identified at the launch area. It is unlikely at this stage of construction that these critical items would be emplaced. However, several such facilities specifically associated with Launch Complex A could be used in conjunction with missile firings from Complex B.

Launch Support Area

The launch support area is located about one nm east of the launch area. The general area is unfenced and rail served and covers approximately 135 acres. It consists primarily of permanent-type housing, fenced and partly fenced open and covered storage, maintenance facilities, motor pools, and a construction materials dump (Figure 11). The area is marked by considerable track activity, both internally and between it and the launch area.

The western housing section contains about 25 permanent-type, one- and one-half-story buildings, eight of which were under construction 25X1 Sixteen buildings, which have an average size of 140 by 55 feet, are arranged in two groups of eight buildings each. This area probably houses the construction workers and such support facilities as those for messing, administration, and recreation. Because this area appears to be permanent, it probably is designed to house the personnel assigned permanently to the complex.

The eastern housing section, partly fenced and measuring 1,450 by 850 feet, is located on the east side of the rail spur that serves the support area. The section contains 13 buildings ranging in size from 140 by 85 feet to 25 by 25 feet. A network of steam lines connecting the buildings was under construction 25X1

A storage and construction support facility is located on either side of the rail spur that serves the area. It contains piles of unidentified material, a concrete batching plant with a conveyer, and at least ten buildings of various sizes. Two rail spurs were added to this area 25X1 Two fenced motor pools are in the vicinity.

Open storage is located in a fenced area 900 by 280 feet, east of and adjacent to the rail spur. Within the area are stacks of unidentified materials and two gable-roofed buildings with an average measurement of 100 by 35 feet. Other fenced open storage areas are located north of the western housing section.

A quarry, outside the general area served by rail, is connected by vehicle track to the launch area. The quarry is located in a rock outcrop approximately 3,000 feet west of the launch area. 25X1 it was only a small operation and showed no signs of activity.

A revetted storage site located approximately one nm east of the support area may be used to store explosives used in construction. The site is not fenced or otherwise secured and consists of two roughly rectangular revetted areas which average 125 by 75 feet. One of the areas contains a structure about 55 by 30 feet, and the other contains an excavation possibly for a similar building. There were no signs of activity at the site.

LAUNCH COMPLEX C

Launch Complex C, in an early stage of construction 25X1 is located 4.3 nm southeast of Launch Complex B at 45-58N 63-39E (Figure 12). The rail line serving the complex is a continuation of that serving Complex B. The extension continues from the point where the line to Complex B turns north. An all-weather road and water line parallel the rail line. 25X1 the only sign of activity to indicate construction of the complex was a single vehicle track that generally followed the alignment of the future road and rail line.

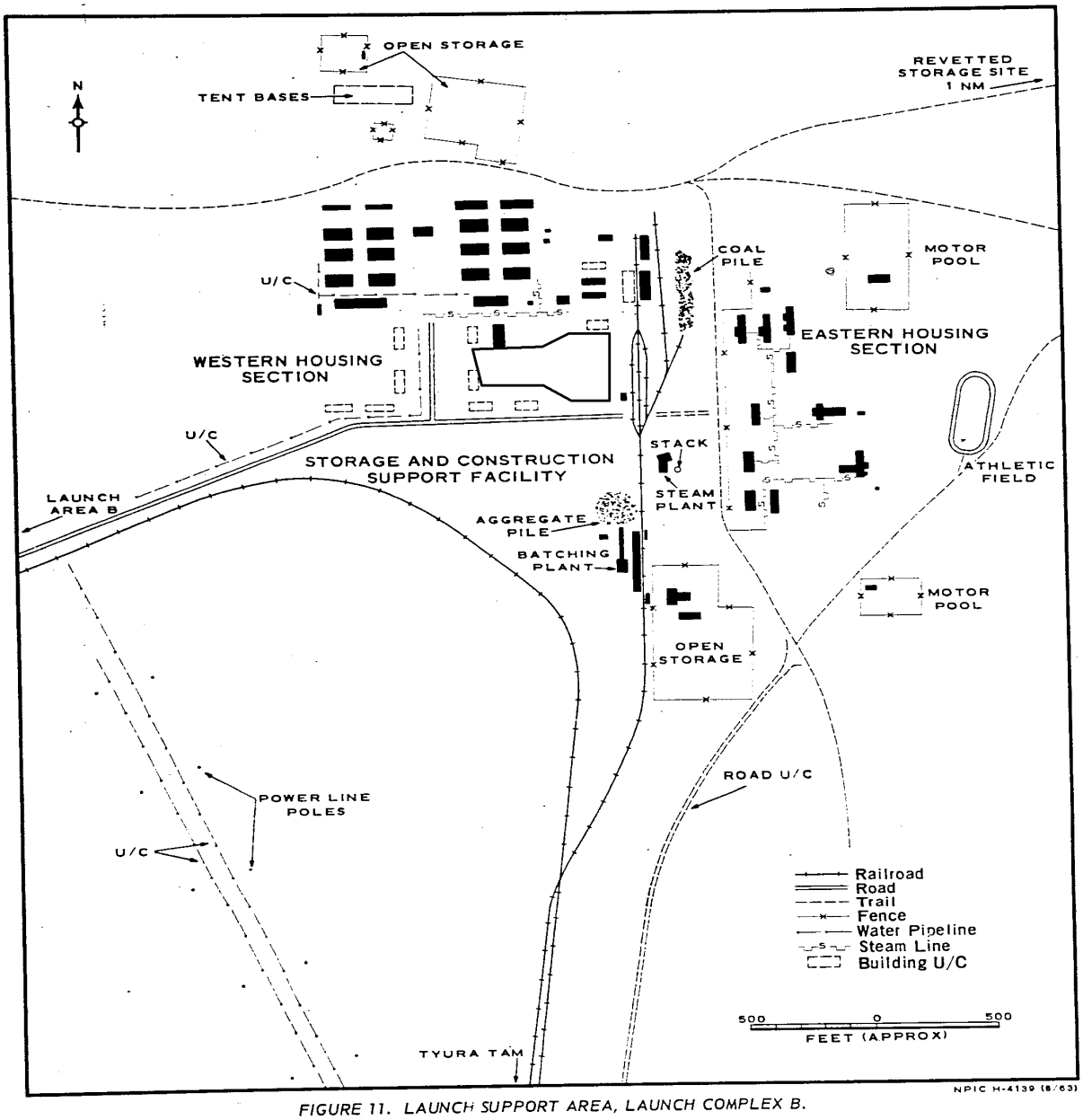

FIGURE 11. LAUNCH SUPPORT AREA, LAUNCH COMPLEX B.

FIGURE 12. LAUNCH COMPLEX C

25X1

25X1

Launch Area

The double-fenced launch area was in an early stage of construction. Identifiable within the area are two launch sites about 1,300 feet apart, under construction, which probably will be road served; a probable control bunker; two semiburied tanks under construction; four possible cylindrical tanks; and three buildings under construction (Figure 13). The area is served by a single rail line that does not appear to serve either of the launch sites.

The launch site on the western side of the area, designated Launch Site C1, contains a structure 50 by 35 feet which is being built in an excavation approximately 100 feet across. East of the excavation is another structure 145 by 35 feet which contains 7 vehicle stalls that vary in width. Three of the stalls were being roofed.

25X1

25X1

25X1

The launch site on the eastern side of the area, designated Launch Site C2, is generally similar to Launch Site C1, except that there are nine rather than seven vehicle stalls. All the stalls have been roofed, and an enclosed structure with a parapet roof divides them into two groups -- four on the south and five on the north. Construction scars and the configuration of the surface suggest that a launch structure similar to that under construction at Site C1 has been covered with earth. There is no evidence of concrete work suggestive of a launch pad.

The probable control bunker measures 60 by 45 feet and has been built in an excavation sufficiently deep to place the roof below ground level. A deep trench, possibly for cabling, has been dug between the bunker and Site C1. A second, shallower trench has been partly dug between the bunker and Site C2.

Centered between and forward of the launch sites is a probable missile-ready building under construction that measures 160 by 45 feet. a tank 15 feet in diameter was being buried about 75 feet north of this building.

25X1

Southeast of Launch Site C1 is an earth embankment, 375 by 50 feet, that probably will support a road to the site. Another earth embankment, 325 by 50 feet, north of Launch Site C2 probably will support a road between the site and the ready building.

Two semiburied tanks

25X1

were under construction east of the rail line. Three tank sections were adjacent to the tanks. Although no pipeline could be identified, an open ditch paralleling the rail line may be for a pipeline to serve these tanks. A small building north of the tanks probably is a valve house.

25X1

The area also contains four possible horizontal cylindrical tanks, and adjacent and parallel to the rail line. Along the rail line as it enters

25X

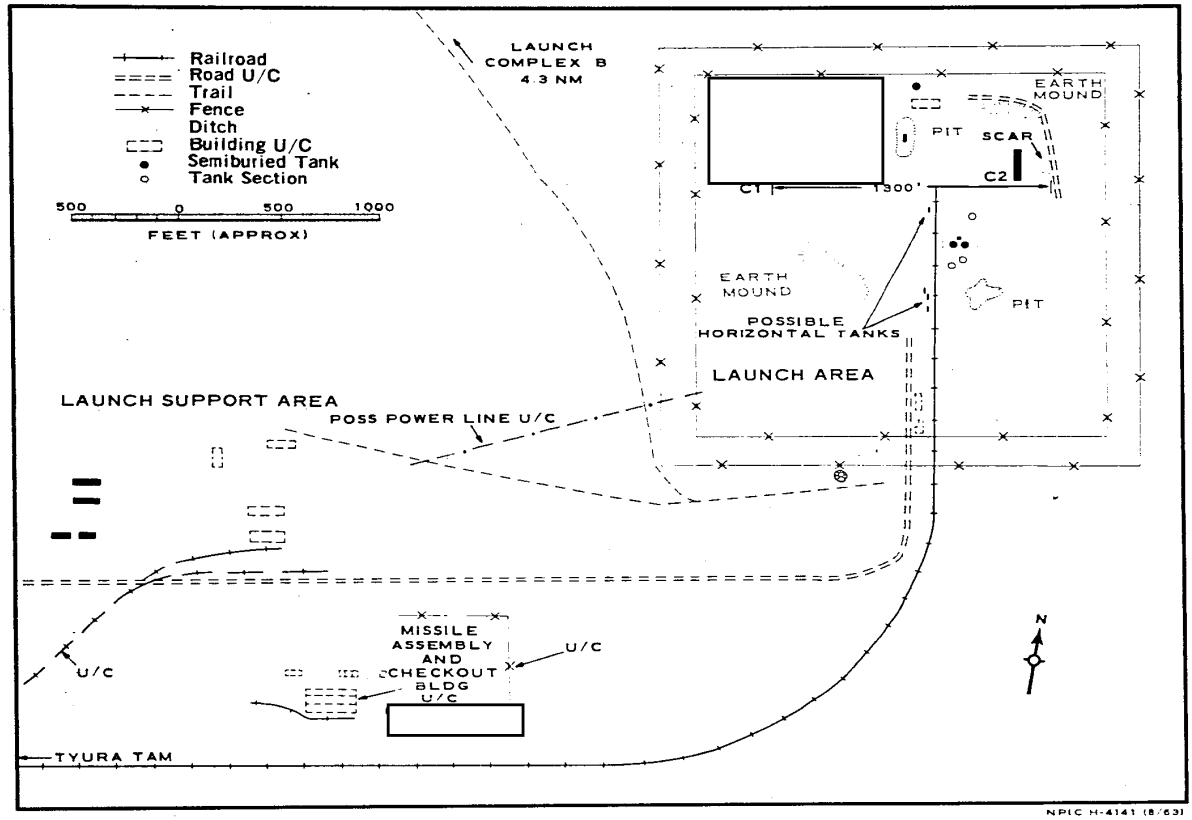

FIGURE 13. LAUNCH COMPLEX C.

the launch area are two buildings under construction. One of the buildings measures 95 by 35 feet, [redacted]

[redacted]

Launch Support Area

The extent of the launch support area was impossible to determine because only a few buildings and roads were discernible. The most significant building in the area was a missile assembly and checkout building, under construction (Figure 13).

The missile assembly and checkout building has a monitor roof [redacted] The bay on the north side is 30 feet wide and 40 feet high. The clerestory center section is 70 feet wide and 60 feet high. The bay on the south side is 30 feet wide and 25 feet high. The west end of the building appears to have two doors, each about 20 feet wide and 40 feet high, that provide access to the monitored sections. When completed, the building probably will have rail and road service at the west end, but no evidence exists of a rail or roadbed east of the building.

This building bears a superficial resemblance to buildings serving a similar function at the other two launch complexes. It differs from these buildings in two respects, however. Although it is rail served, it apparently is not a rail-through building. Furthermore, the counterpart buildings at Launch Complexes A and B are the same height on either side of the longitudinal monitor, whereas the assembly and checkout building at Complex C is higher on the north side of the monitor than on the south side.

The area also contains four completed buildings, five buildings under construction, and footings or foundations for three buildings. Of the completed buildings, two have hip roofs and measure 80 by 55 feet and two have gable roofs and measure 160 by 45 feet. The buildings under construction range from 160 by 50 feet to 35 by 25 feet.

SUPPORT BASE

The support facilities for the TTMTC have been grouped into three general categories, regardless of their geographical location, as follows: operational support facilities, logistical support facilities, and administrative support facilities. In some cases, the function of a particular facility may extend into several categories; in those cases, the facility has been included under its primary functional category.

Most of the facilities that support operations of the TTMTC are located in the Support Base, which is situated south of Tyura Tam village, between the Aralsk-Tashkent rail line and the Syr-Darya (Figures 2 and 14). Support facilities outside the immediate base area are also treated in this section.

OPERATIONAL SUPPORT FACILITIES

These facilities consist of communications facilities, including land lines and microwave facilities, and the propellant production and storage facility.

Communications Facilities

The TTMTC appears to be served by three communications systems. The largest and by far the most important of these is the radio communications system, which includes numerous facilities grouped in three separate areas. In addition, the TTMTC is served by a possible microwave relay communications system and by a land-line system that probably includes a multichannel carrier circuit.

The three primary radio communications facilities serving the TTMTC have been designated Communications Areas A, B, and C. Communications Area A is located 5 nm south of Launch Complex A, and Communications Areas B and C are located in the Support Base.

Communications Area A. This area (Figure 15), a probable transmitting station located at 45-50N 63-18E, [redacted] contained 14 rhombic antennas in various stages of construction, two linear stick-mast arrays, and four single masts, three of which were still lying on the ground. [redacted] two new rhombic antennas had been added, one rhombic had been removed, and all those under construction had been completed. Eight additional stick masts had been erected as had those that were lying on the ground [redacted] Details of all rhombic arrays are given in Table 1.

25X1

25X1

25X1

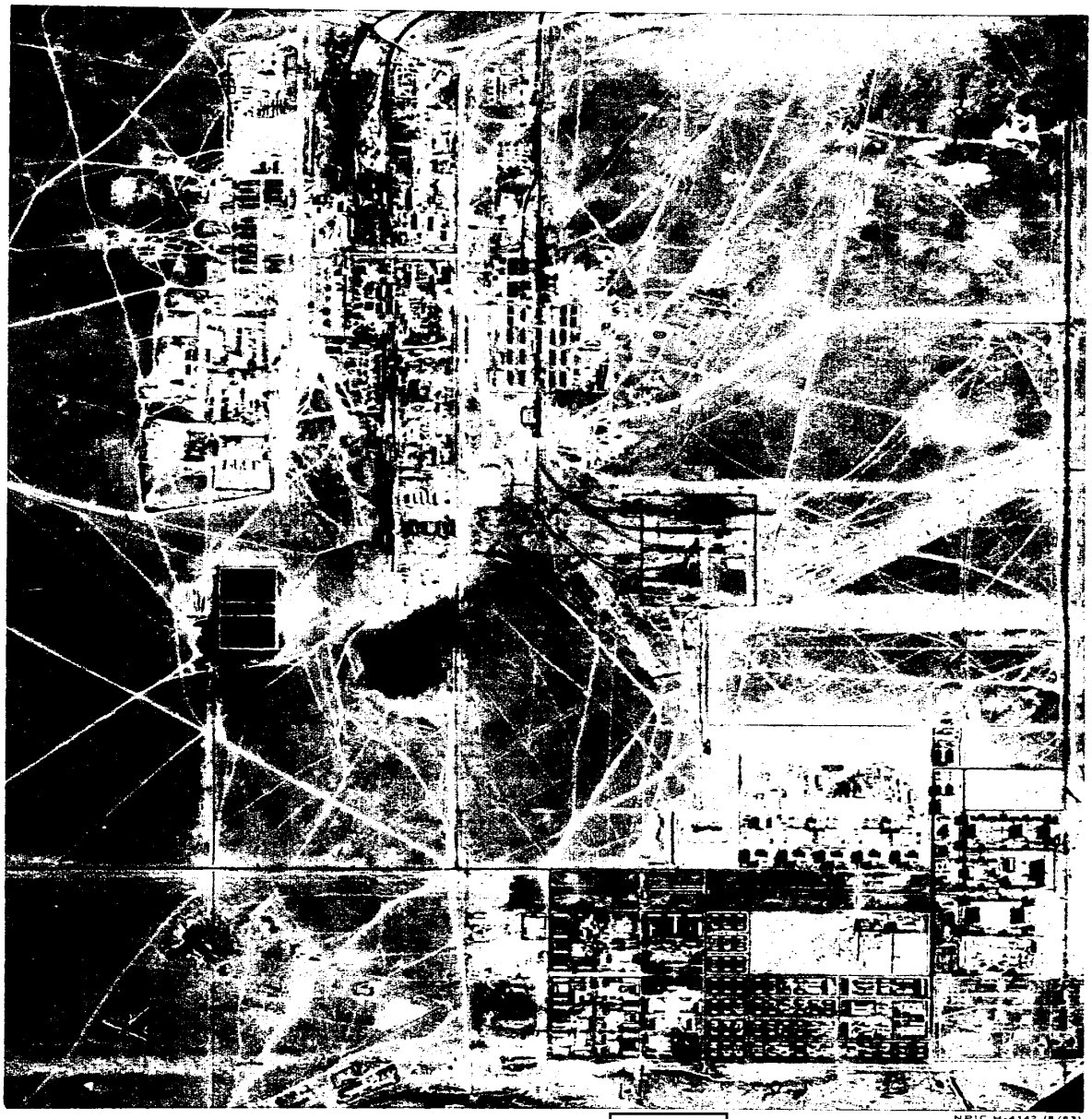

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FIGURE 14. SUPPORT BASE

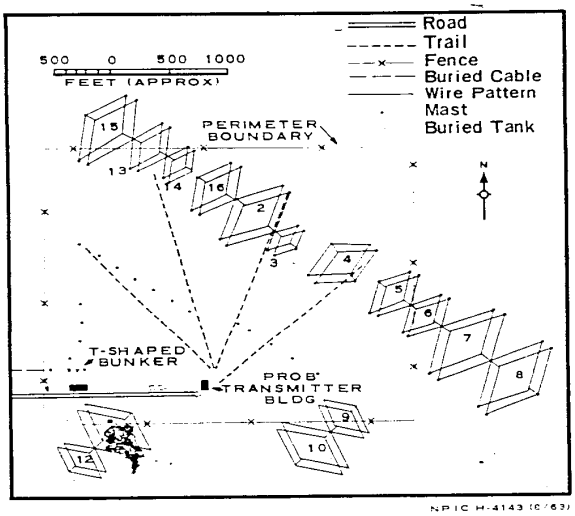


FIGURE 15. COMMUNICATIONS AREA A.

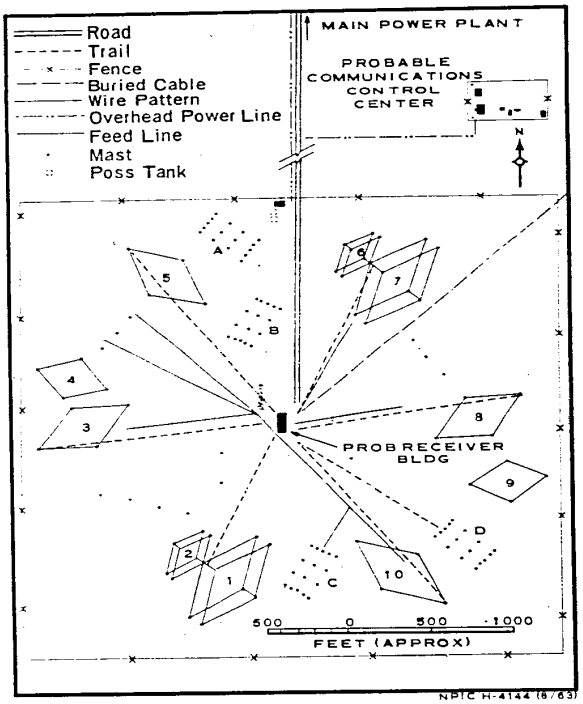


FIGURE 16. COMMUNICATIONS AREA B.

This area covers approximately 225 acres and measures approximately 2,970 by 2,680 feet. A secondary power line connects the area with the power substation in the support area of Launch Complex A. In addition, a buried cable line, probably part of a wire

Table 1. Orientations and Dimensions of Rhombic Antenna Arrays, Communications Area A

Array No																
1**																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

*Approximate.
**Removed

communications system, connects this area with the key areas of Launch Complex A.

The area contains six buildings, one of which has two stories and probably is the transmitter building. This building measures 85 by 55 feet and has a gable roof. The remaining buildings are all single story and range in size from 150 by 50 feet [redacted] Three probable buried tanks 30 feet in diameter and two bunkers, one 40 feet square and the other T-shaped, constitute the remaining structures in the area. The T-shaped bunker measures 30 by 15 feet for the bar and 15 feet square for the stem.

25X1

25X1

Communications Area B. This area, which is located at 45-38N 63-18E, is fenced and measures 3,300 by 3,280 feet (Figure 16). It contains 123 masts arranged in 10 rhombic arrays (items 1-10), four Type B fishbone arrays (items A-D) 1/, two 3-mast antenna arrays, one 4-mast antenna array, and three single masts. Details on the rhombics and fishbones are given in Table 2. The area also contains two buildings, one of which is a probable receiver building, and two possible tanks. In addition, an associated probable communications control center for the TTMTC is located just to the north of the area. No apparent changes were made in the area [redacted]

25X1

25X1

The area is served by an overhead power line which leads from the main power plant in the Support Base. An overhead power line also connects the area with the probable communications control center.

The probable communications control center, approximately 1,200 feet north of Communications Area B, is enclosed by a fence that measures 470 by 320 feet. The area contains six buildings [redacted]

25X1

Table 2. Orientations and Dimensions of Antenna Arrays, Communications Area B

A. Rhombic Antenna Arrays

Array	[redacted]
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

25X1

Array	
A	
B	
C	
D	

*Approximate.

25X1

25X1

Communications Area C. This area, also located in the Support Base, consisted of three stick masts and two buildings surrounded by a fence measuring 320 by 310 feet (Figure 17). Both buildings are single story. One has a gable roof and measures 35 by 25 feet; the other has a flat roof and measures Two of the masts are 75 feet tall and the other, which was removed was 55 feet tall.

25X1

25X1

25X1

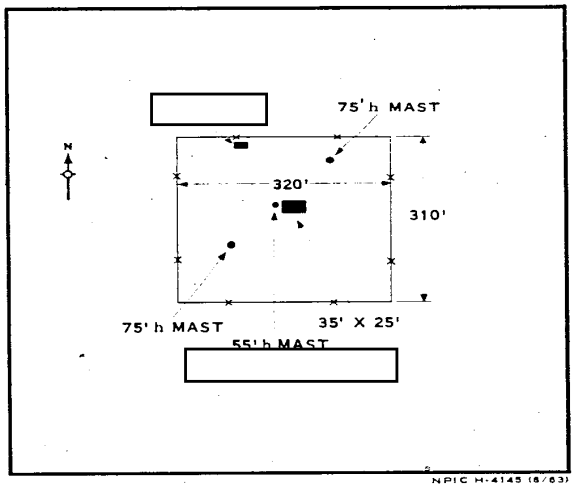


FIGURE 17. COMMUNICATIONS AREA C.

25X1

Possible Microwave Relay Communications Facilities. A series of self-supporting lattice towers, spaced at intervals of 10 to 50 nm along the rail line between Novo-Kazalinsk and Kzyl Orda, indicates a possible microwave relay communications network. Other towers within the TTMTC may function as a part of this network.

Wire-Line Communications Facilities. Probable wire lines parallel the Aralsk-Tashkent rail line. Two lines of poles parallel the rail line and apparently connect with other lines in the TTMTC. One of these may carry a multichannel carrier circuit, and the other may be used for normal railroad communications.

Propellant Production and Storage Facility

The Propellant Production and Storage Facility, located along the rail line serving the launch facilities, is 4 nm north of Tyura Tam village and encompasses about 184 acres (Figure 18). The facility is served by several rail transfer points and sidings as well as by the main road of the TTMTC. It contains the following main components along the east side of the rail line: a probable propellant production plant, an administration and storage area, and a water storage area. West of the rail line is a probable propellant tank car service area.

Administration and Storage Area. This area measures 300 feet square and appears to be the oldest in the facility. It contains seven conventional administration and storage-type buildings, two probable earth-covered bunkers, Each of the bunkers measures and appears to have a vent, dormer, or entrance at its western end.

25X1

25X1

Water Storage Tank Area C. This area is discussed below with the other water storage tank areas in the section on the logistical support facilities.

Propellant Production Plant. The fenced plant area measures about 1,500 by 700 feet, has guard towers at the corners, and contains at least nine major buildings. A rail spur into the plant area was completed The spur divides into three spurs within the fenced area. Along the southern edge of the area are two buildings, 85 by 40 feet and 60 by 35 feet. A possible cooling tower or water-treatment building, 60 by 40

25X1

25X1

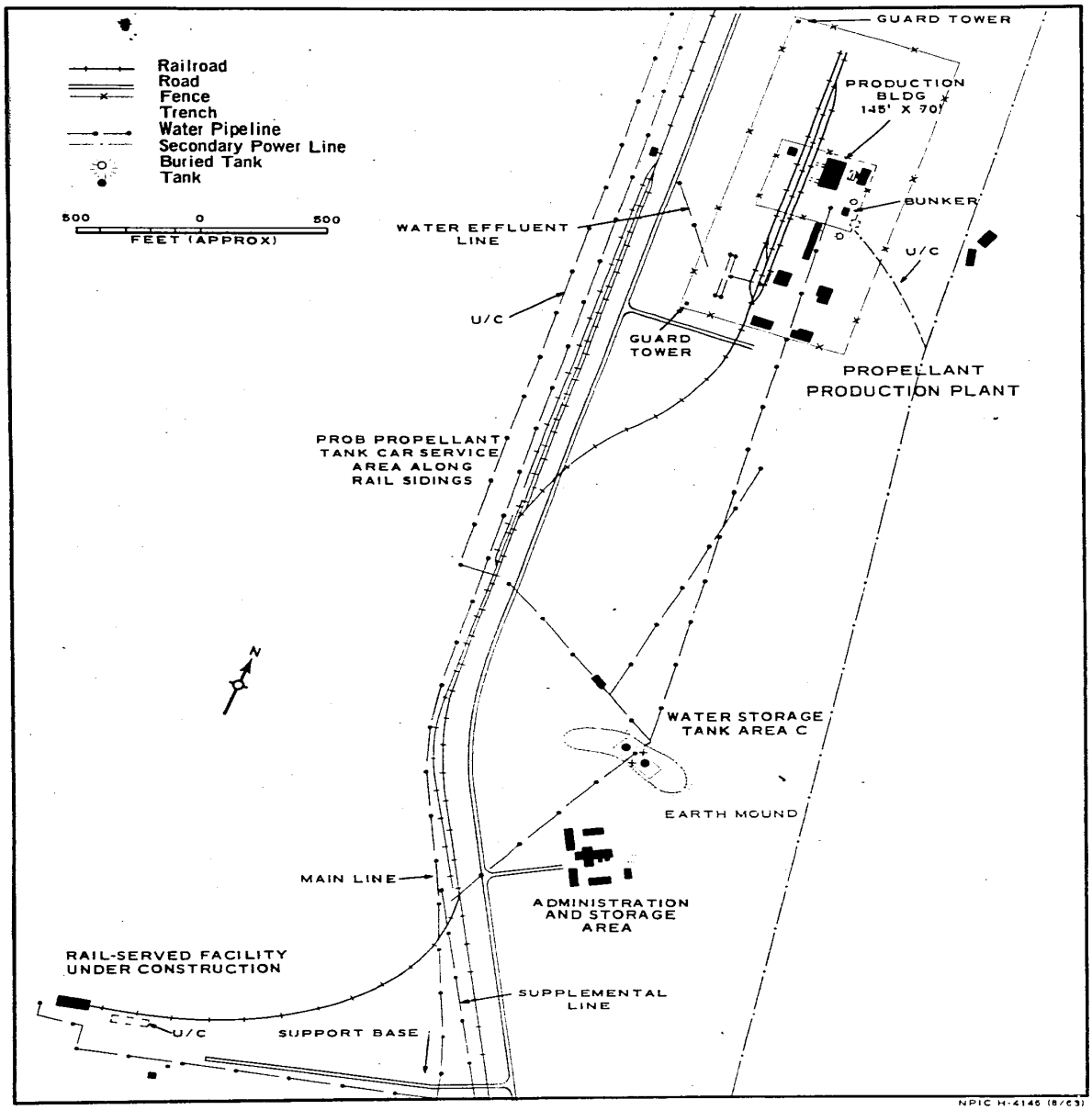


FIGURE 18. PROPELLANT PRODUCTION AND STORAGE FACILITY.

feet and located north of the larger building, appears to be the point of origin of a water effluent line that probably passes under the main rail line and discharges soon thereafter. East of this building is a possible administration building. A long narrow building, is located about 150 feet northwest of the administration building and 200 feet south of the main production building.

The main production building, which is enclosed by a second fence, is situated at the end of a large water line and a secondary power line. The building measures 145 by 70 feet. The building has two sections, the taller of which is 70 feet. The high-bay section appears to be divided into six or more separate subdivisions. Near each end of the west side of the building is a shedlike structure or concrete loading dock leading to the rail spur.

West of the main production building and adjacent to the rail line is a possible rail-transfer or storage building that measures . East of the main production building are a possible generator building, and a deep excavation, which may be the foundation for a propellant-storage building. About 100 feet south-southeast of the main production building is an earth-covered storage bunker shaped like a truncated pyramid and measuring 45 by 35 feet. Two buried tanks, in diameter, are adjacent to the bunker.

Along the main rail line to the west of the probable propellant production plant are three rail sidings approximately 2,000 feet in length that probably constitute a propellant tank car service area. the area contained a flat-roofed rail-served building and two smaller buildings. the large building had been removed.

LOGISTICAL SUPPORT FACILITIES

These facilities include a central support facility; water treatment, storage, and distribution facilities; transportation facilities; power production and distribution facilities; and a storage and construction support area.

Central Support Facility

This unfenced facility is located about 9 nm southwest of Launch Complex B and south of the road, rail line, and water pipeline ditch which lead to Complex B (Figure 19). It is served by a rail spur which branches from the line to Complex B. Approximately 2,000 feet in, the spur divides into two spurs and forms a V with legs about 2,000 feet long. Each spur has a short siding. Branching from the east leg of the V is a possible spur under construction. No improved road enters the area, but many unimproved roads and vehicle tracks are evident.

The facility includes a concrete batching plant or rock crusher, a gravity-type rail-car unloading pit with a conveyer, three bulk transloading buildings, nine buildings of undetermined use, and two spherical objects. Supplies in open storage are scattered throughout the area.

North of the facility three short ditches branch from the water pipeline ditch to Complex B, cross the roadway, and apparently pass under the rail line. Neither the purpose nor any further extension of these ditches is apparent.

Water Treatment, Storage, and Distribution Facilities

The complete water system for the TTMTC appears to consist of two water treatment facilities, a probable water purification plant, four water storage areas, and four major dis-

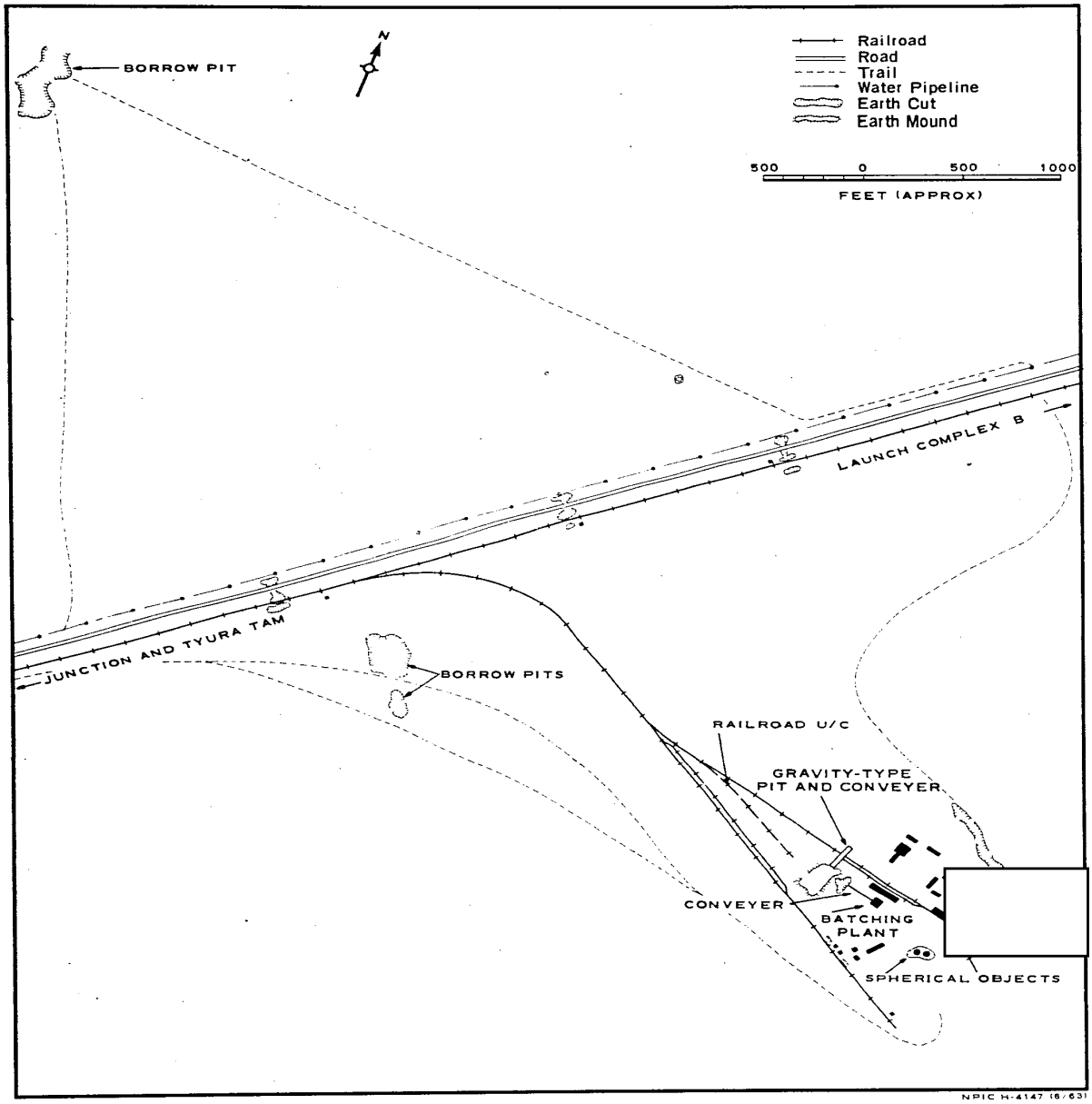


FIGURE 19. CENTRAL SUPPORT FACILITY.

25X1

tribution lines. A series of seven identical pumping stations is located along the pipeline that leads to the Rangehead.

Water Treatment Facilities. Two treatment facilities are located in a fenced area southeast of the village of Tyura Tam (Figure 20). One (Facility A) is located on lowland near the Syr-Darya. A major pipeline from this facility terminates at Tyura Tam village and another at Launch Complex A, respectively. The second facility (B) is located on the bluff above Facility A and is connected by pipelines to the main power plant and to Launch Complex B.

It is possible that much of the water used at the TTMTC receives little or no treatment, because some of the pipelines appear to lead directly from the river and have few if any facilities along their entire length.

A small probable water purification plant is located just northwest of the treatment facilities in a separately fenced area. Because one of the pipelines can be traced to the Administration and Housing Area, it is probable that this facility purifies water for drinking purposes.

Water Storage Facilities. The TTMTC contains four water storage tank areas (labeled A, B, C, and D): one associated with Complex A, one associated with Communications

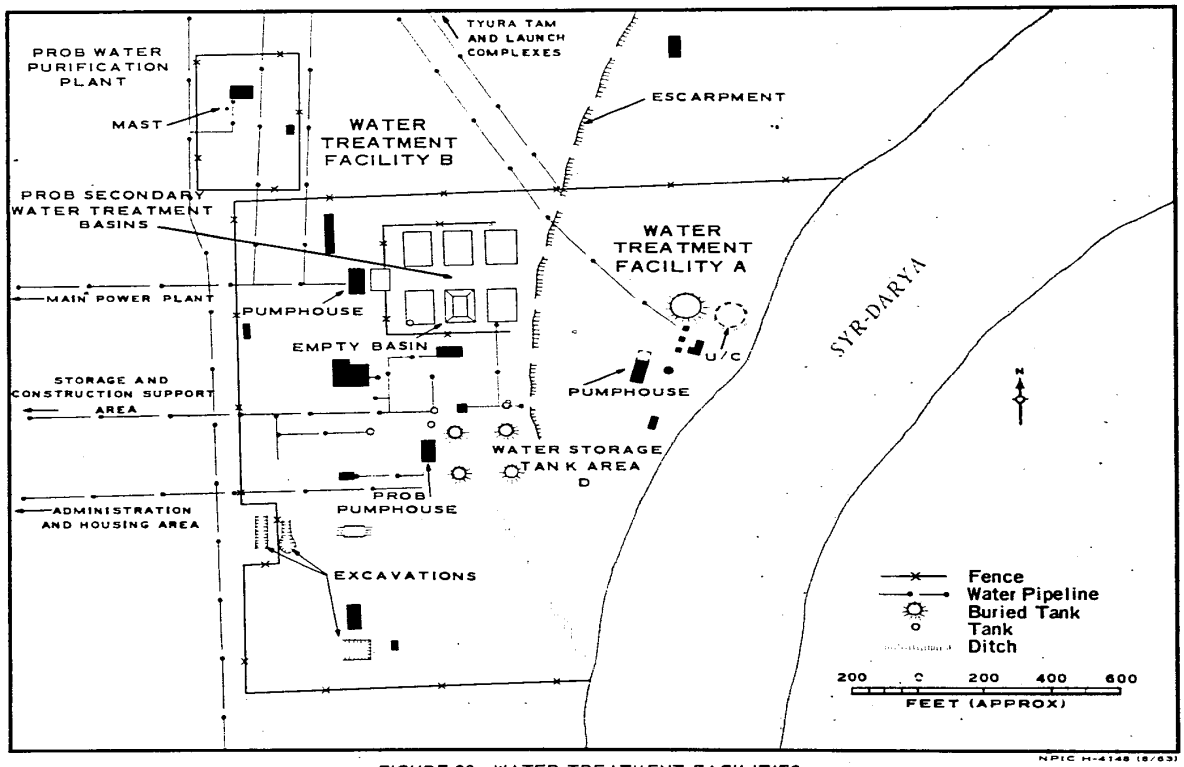


FIGURE 20. WATER TREATMENT FACILITIES.

Area A, one associated with the Propellant Production and Storage Facility, and one associated with the base support area near Tyura Tam village. Water Storage Tank Area A is fenced and contains a valve house; and two earth-covered storage tanks [redacted]

25X1 [redacted] Water Storage Tank Area B is located 2,500 feet west of Communications Area A and contains two earth-covered storage tanks 55 feet in diameter and possibly two semiburied tanks. Water Storage Tank Area C is in the area of the Propellant Production and Storage Facility (Figure 18) and contains two tanks 35 feet in diameter in a fenced area on top of a small hill, and a

25X1 pumphouse [redacted] located 375 feet northwest of the tanks. Two small

25X1 buildings and a tank [redacted] were

25X1 removed from the area [redacted] Water Storage Tank Area D is within the fence that encloses Water Treatment Facility A (Figure 20). It consists of four buried tanks 65 feet in diameter, a probable pumphouse, and three other buildings. This storage area may supply water for the Administration and Housing Area and the Storage and Construction Support Area.

Transportation Facilities

The Aralsk-Tashkent rail line provides the primary access to the TTMTC. Railroad shops, a classification yard, and a passenger station located along the main rail line north of Tyura Tam village constitute the major rail facilities of the TTMTC. The classification yard, approximately 3,200 feet long and 12 tracks wide, is located immediately north of Tyura Tam village and 2,500 feet west of the junction of the main line with the line running north to the Rangehead. A single-track wye turnaround, two car-repair shops, and an unidentified building that were located 4,000 feet west of the classification yard [redacted] appear to be abandoned.

The only air facility at the TTMTC is located 2 nm northwest of the Administration and Housing Area. The airfield consists of a blacktop runway 3,815 by 140 feet, a blacktop taxiway 965 by 35 feet, and a hardstand 1,540 by 210 feet paralleling the runway. A service apron 155 by 100 feet is adjacent to the taxiway. Two helicopter pads, approximately 75 feet in diameter, are east of the aircraft dispersal area. Two buildings, [redacted] 25X1 25X1 [redacted] are the only structures at the airfield.

Power Production and Distribution Facilities

The main power plant and the steam/power plant at Launch Complex A probably are capable of supplying power to sustain operations at the TTMTC. The Aralsk-Tashkent power grid and mobile power units could supply supplementary or emergency power.

The main power plant (Figure 21) is served by a rail line that branches from the main line and passes through the Storage and Construction Support Area. The rail line branches into eight spurs, seven of which enter the power plant. The power plant is enclosed by a solid fence that measures 1,340 by 1,100 feet. The area contains a power building, a control building, a coaling tower, a coal preheating building, a pumphouse, and several additional features.

The power building consists of a boilerhouse 140 by 95 feet, a generator hall 140 by 75 feet, and a transformer section 140 by 30 feet. A longitudinal section, [redacted] 25X1 extends the full length of the east side of the building. Three induced-draft ducts indicate that there probably are three boilers.

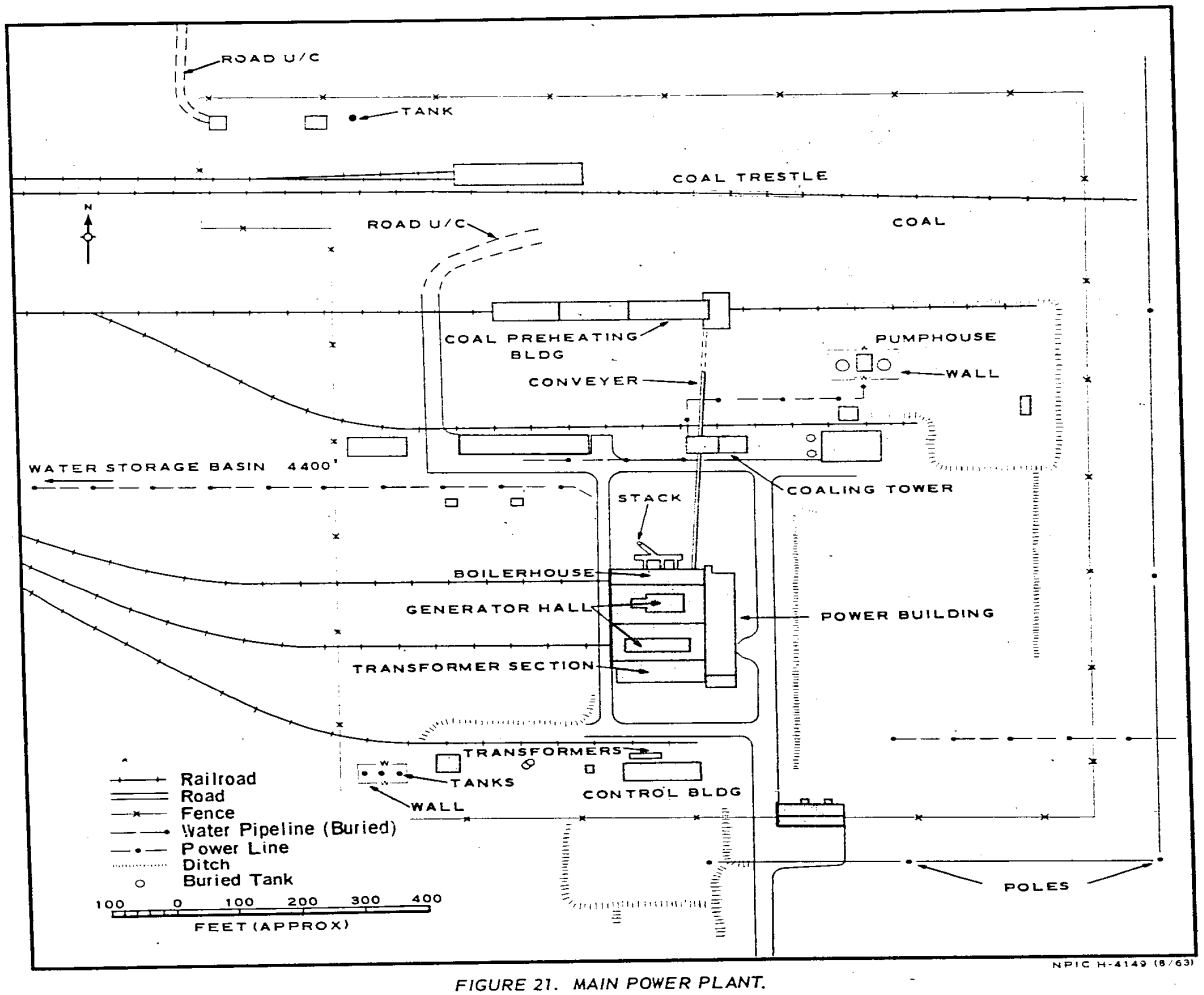


FIGURE 21. MAIN POWER PLANT.

A coal yard north of the preheating building contains a single rail spur with a gravity-type coal trestle approximately 300 feet long. The spur extends approximately 190 feet beyond the fence. The coal preheating building measures about 320 by 45 feet and is entered by a rail spur.

The coaling tower, 95 by 35 feet, is connected with the power building by a conveyer, 325 by 10 feet. Two buried tanks, 25 feet in diameter, located in a walled enclosure northeast of the coaling tower are serviced by a pumphouse 35 by 20 feet. Buried pipelines lead to the coaling tower, to a building 210 by 40 feet that is west of the coaling tower,

and probably to the coal preheating building.

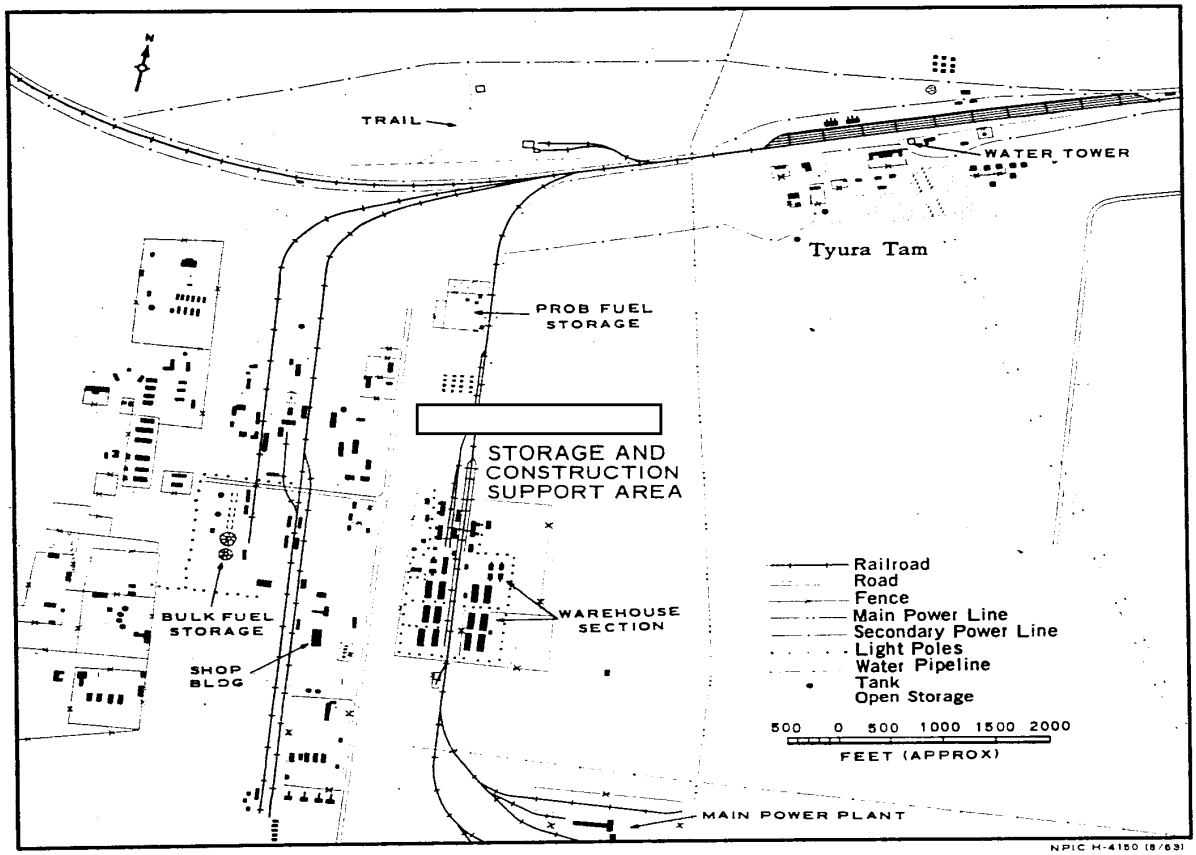
The boilerhouse is served by a water storage basin 4,400 feet to the west which is connected to the river by a ditch.

The power substation and steam/power plant at Launch Complex A are discussed in conjunction with that facility.

Storage and Construction Support Area

This area, located southwest of Tyura Tam village, is rail served and is divided into numerous separately fenced sections (Figure 22). It contains a variety of open and covered storage and transshipment/warehouse-type buildings. In addition to small warehouse, shop, and open storage sections, the area contains the following more important components.

A fenced probable fuel storage section, located immediately west of the eastern spur serving the area, measures approximately 540 by 410 feet and contains 43 probable fuel tanks. Immediately south along the rail spur



25X1

FIGURE 22. STORAGE AND CONSTRUCTION SUPPORT AREA.

is an open storage section which contained 15 stacks of unidentified material. These stacks varied in length from 55 to 85 feet and were about 15 feet wide. a new rail siding was constructed to serve this section.

Farther south along the rail spur, within a fenced area measuring 1,800 by 1,250 feet, is a warehouse section containing 35 buildings of various sizes. Four rail sidings from the rail line that serves the main power plant terminate in this section. A fifth siding terminates in a fenced area 190 by 155 feet located south of the warehouse section.

A bulk fuel storage section containing two large earth-mounded structures and several smaller features is centrally located in the support area. The larger structures probably are mounded fuel tanks and are shaped like truncated cones. They measure 110 feet across the base and 55 feet across the top. Two fuel tanks a large earth mound 660 by 45 feet, and four miscellaneous buildings are also present.

A large monitor-roof shop building located in the south-central portion of the support area probably is the only building in the area capable of handling heavy machinery and material. It measures 195 by 85 feet overall; the monitor section measures only 165 by 45 feet. The monitor may define the limits of an overhead traveling crane.

ADMINISTRATIVE SUPPORT FACILITIES

The main administration and housing area of the TTMTC is located in the Support Base near the Syr-Darya and approximately 2 nm south of the Aralsk-Tashkent rail line. The area covers approximately 460 acres and contains at least 257 buildings, 50 of which are administration-type, 132 housing-type, and the remaining 75 either storage or shop-type structures. Fourteen buildings under construction probably are administration type. The total floor space of the completed buildings in the area is approximately 1,608,000 square feet. Additional housing is provided in the support areas of each of the complexes for personnel employed on site.

A new section of Tyura Tam village is located south of the classification yard and consists of 7 small fenced areas and 20 buildings. The old village is adjacent to the new section and consists of old mud huts.

INSTRUMENTATION FACILITIES

A direction of fire to the northeast (40 degrees) is considered to be the probable primary direction of fire because the largest downrange instrumentation stations, as well as the interferometer and the instrumentation control center, appear to be located primarily in relation to this direction. In addition, a projection of the 40-degree azimuth from Complex A passes through the instrumentation facilities on Kamchatka Peninsula. These facilities are similar and in some instances identical with those found in the Rangehead and probably constitute the terminal range facilities.

RANGEHEAD INSTRUMENTATION

At least 13 instrumentation sites, including the Instrumentation Control Center and the interferometer, are located in the immediate vicinity of Complex A (Figure 23). The pattern

and arrangement of these sites are consistent with an instrumentation layout designed to provide both optical and electronic coverage of the launching and powered-flight phases of missile firings from this complex. The size, shape, and orientation of facilities vary considerably between sites, indicating that there are several types of instrumentation in the area. Possible types of equipment include high-speed cameras, electronic velocity-measurement devices, and telemetry receivers. The following is a description of 11 instrumentation sites, that is, exclusive of the Instrumentation Control Center and the interferometer, which are treated separately.

Instrumentation Sites

The major instrumentation site (Figure 23, item 1), located 15,050 feet west of the launch platform, consists of two buildings, one bunker, three 30-foot masts, and several unidentified objects. Buried cable lines appear to connect this site with other key areas of Complex A.

Six camera stations (item 2) are located within 450 feet of the launch platform.

An instrumentation site (item 3) consisting of a pit, two mounds, [redacted] is located north-northwest of the launch area. 25X1 25X1

[redacted] 25X1

A possible instrumentation site (item 5) consisting of a possible building [redacted] 25X1

[redacted] 25X1

is located northeast of the launch area. Buried cable lines appear to connect this site with facilities near the center of the launch area.

A possible mast (item 6) with a counterpoise is located southeast of the launch area. Another radial pattern is located 130 feet southwest of the mast, but no mast can be identified.

An instrumentation site (item 7) consisting of a large mound [redacted] which probably are instruments, is located east-southeast of the launch area. 25X1 25X1

An instrumentation site (item 8) consisting of a probable building [redacted] is located southeast of the launch area. 25X1 25X1

An instrumentation site (item 9) consisting of one object, possibly a van, measuring [redacted] is located southeast of the launch area. 25X1

An instrumentation site (item 10) consisting of a circular object, possibly an instrument, 10 feet in diameter [redacted] is located south-southwest of the launch area. 25X1

A possible instrumentation site (item 11) consisting of two pits that are possible instrumentation positions, is located south-southeast of the launch area.

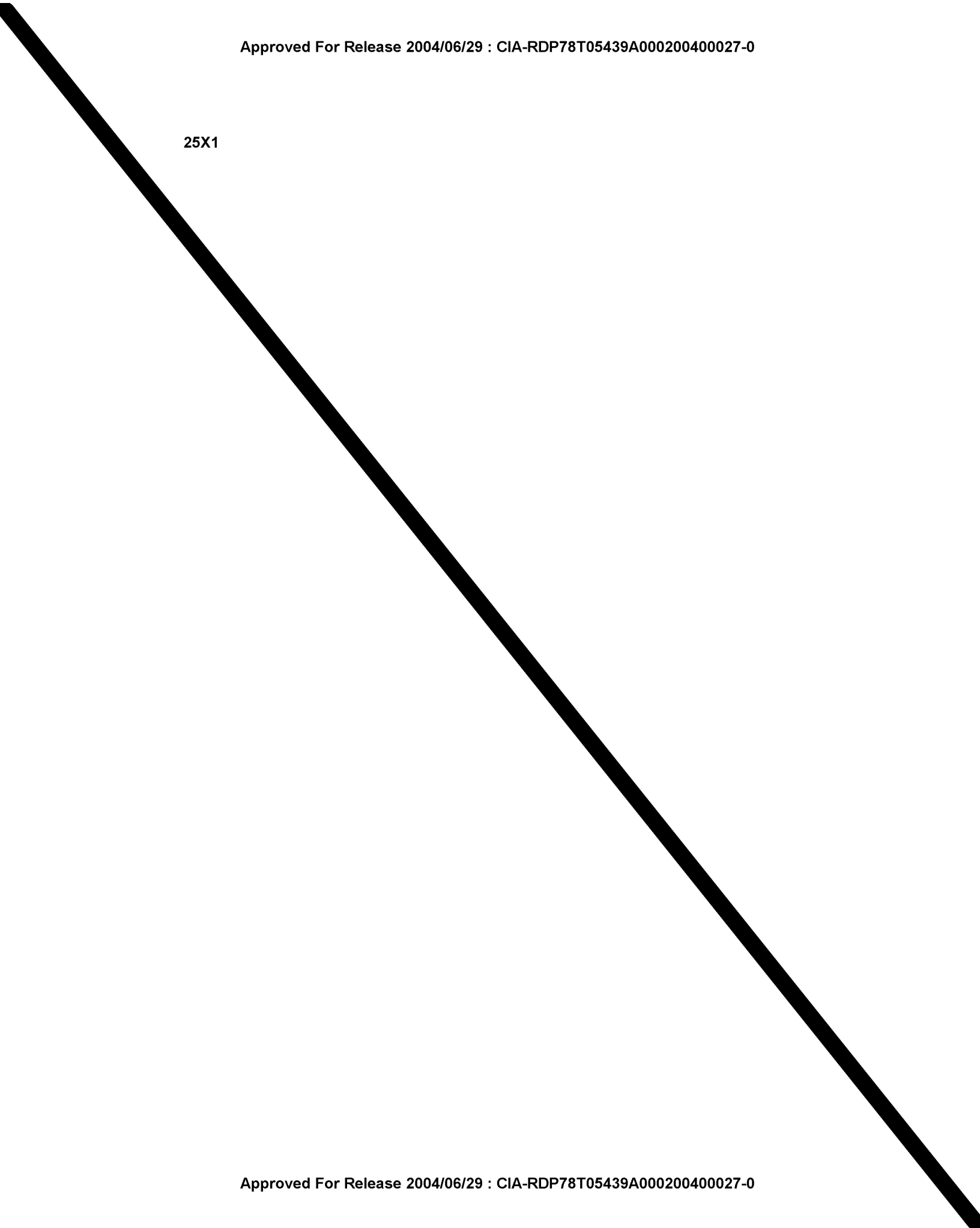
[redacted] two sites located southeast of the launch area were fenced and seemed to bear some relation to the interferometer. By [redacted] however, both sites appeared to have been abandoned. 25X1 25X1

Unidentified lines of parallel earth scars appear to enclose Complex A and pass near several of the instrumentation sites. Although the purpose of these scars cannot be determined, they possibly serve either as a perimeter network of cables or as a perimeter access or patrol road.

Instrumentation Control Center

The Instrumentation Control Center (Figure 24) is located approximately 4,680 feet southwest of the launch platform at Complex A. The overall size of the center was approximately doubled [redacted] This installation, which is fenced and measures 25X1

25X1



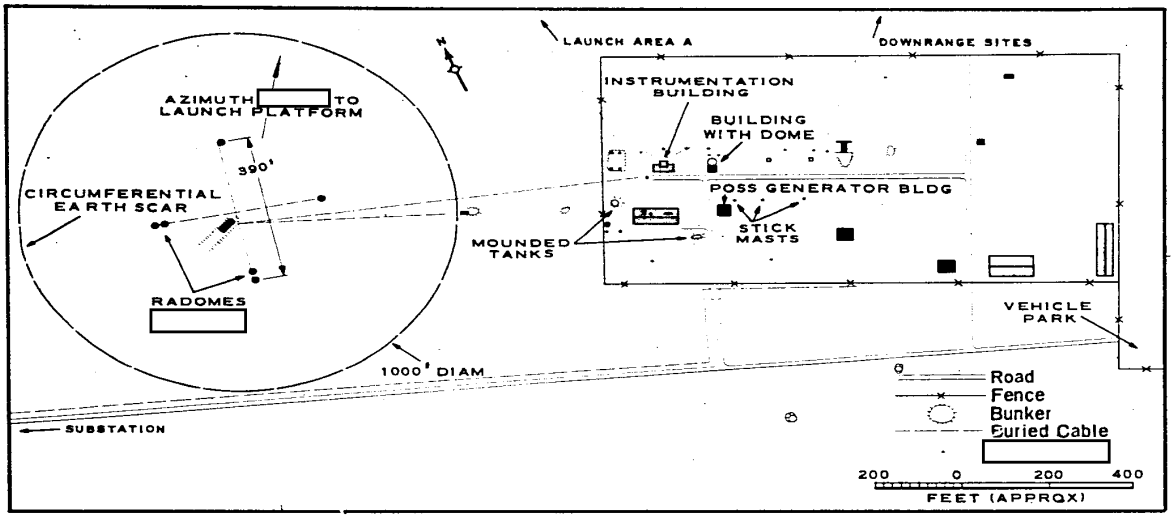


FIGURE 24. INSTRUMENTATION CONTROL CENTER AND INTERFEROMETER.

1,160 by 640 feet, includes eight major buildings, a large probable bunker, several instruments, and miscellaneous objects. a large possible tracking antenna was added. Cables connect the center with the interferometer, the launch area, the downrange instrumentation sites and a point near the power substation. One of the buildings in the area has a 20-foot-diameter dome on the roof.

Interferometer

The interferometer (Figure 24), located 1,140 feet west-northwest of the Instrumentation Control Center, contains six radomes connected by buried cables forming a "plus" configuration within a cleared circular area 1,000 feet in diameter. The cleared area is surrounded by a circumferential earth scar.

The radomes are One radome is located at the end of each of the four legs of the "plus," at a point 195 feet from the center. In addition, a second radome is positioned 20 feet in from the ends of the northwest and southwest legs. A line projected from the center of the "plus" through the launch platform is oriented on an azimuth of This is generally consistent with the probable primary direction of fire to the Kamchatka Peninsula.

An earth-covered bunker, 20 feet wide, with an entrance on the southwest side, is located near the center of the "plus." A buried cable connects this bunker with a smaller bunker located just outside the circumferential earth scar, 540 feet to the southeast. A second cable connects the center bunker with the Instrumentation Control Center.

DOWNRANGE INSTRUMENTATION SITES

Fifteen instrumentation sites have been identified downrange from the Rangehead (Figure 25). Although Sites 1 through 9 are located south of the Rangehead, they are included in this section because they are believed to constitute a part of the overall instrumentation of the TTMTC.

The largest and apparently most significant sites -- Sites 14 and 15 -- probably are the major downrange instrumentation control centers. A line bisecting the angle formed by the Instrumentation Control Center and Sites 14 and 15 is oriented on an azimuth of [redacted] the probable primary direction of fire. Table 3 gives pertinent data on Sites 1-13.

Site 14, a major downrange instrumentation center, is located approximately 60 nm north of Complex A. It is situated within a fenced enclosure that measures 765 by 640 feet and contains 17 buildings of various sizes. The most significant structures within the enclosure are two domes, one each on the roof of two build-

Table 3. Data on Downrange Instrumentation Sites

Site	[redacted]	Coordinates		Remarks
1		45-29N	63-15E	Consists of 3 prob bldgs [redacted]
2		45-42N	63-02E	Consists of lattice tower 85' high
3		45-45N	63-19E	Consists of one small bldg
4		45-44N	63-16E	Consists of 2 small bldgs
5		45-45N	63-27E	Consists of 2 small prob bldgs
6		45-46N	63-23E	Consists of one small bldg
7		45-47N	63-14E	Consists of irregularly shaped area containing one small bldg [redacted] Approx 2,550' S is an area containing a lattice tower and 2 poss observation towers
8		45-49N	63-20E	Consists of 2 small bldgs 1,800 feet apart
9		45-51N	63-23E	Consists of one small bldg
10		46-00N	63-17E	Consists of one small bldg
11		45-59N	63-16E	Consists of 3 small bldgs [redacted]
12		46-14N	63-16E	Consists of a poss radar & assoc tower, one small bldg, a small earth mound, [redacted]
13		46-15N	63-15E	Consists of a fenced area measuring 435 x 325' and includes a bldg [redacted], an earth-covered bunker 35 x 30', [redacted] A prob instrument is 435' NW of the enclosure. Buried cable connects site with Instrumentation Control Center.
14		46-55N	63-25E	
15		46-20N	64-48E	

*Computed from Launch Complex A.

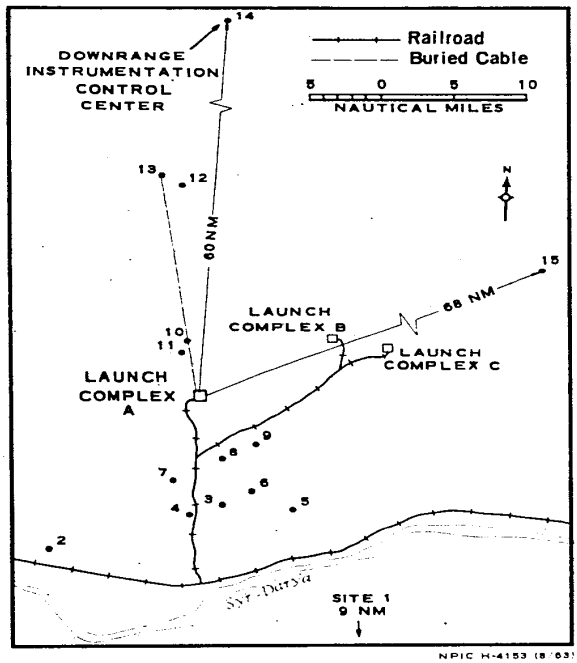


FIGURE 25. DOWNRANGE INSTRUMENTATION.

ings. These domes are about 60 feet above ground level. Another building has a possible dome on its roof. Several probable instruments also are located within the fenced enclosure. About 1,000 feet north of the fenced area, at the terminus of a short dirt road, is an associated instrumentation station consisting of a building with a dome on the roof and four adjacent probable instruments arranged in a semicircle. More than 2,000 feet north-northwest of the fenced enclosure are two isolated instruments, each served by a dirt road. A sod landing strip, 740 by 100 feet, is located east of the fenced enclosure.

Site 15 is located approximately 68 nm northeast of Complex A. It consists of two fenced enclosures, several unfenced buildings with associated instruments, and an airstrip 3,600 feet long. The larger of the two enclosed areas measures 700 by 440 feet overall and contains several buildings and unidentified objects. The smaller enclosure, which measures 190 by 120 feet, contains seven unidentified objects. Outside the fenced areas are two identical buildings or possible dome-covered instruments and three other possible instruments, [redacted] 25X1

PROBABLE TERMINAL RANGE INSTRUMENTATION

Five sites identified in the Uka/Yelovka area of the Kamchatka Peninsula (Figure 26) probably constitute a part of the terminal range instrumentation of the TTMTC. The sites are located about 3,400 nm from the Rangehead in relatively isolated areas. Two of the sites are in the heavily forested mountainous area northeast of Yelovka. The remaining three are situated along the coast of the Bering Sea.

Instrumentation Site A (Figure 27) is located at 57-51N 162-05E, 8 nm north of Uka. It consists of an interferometer, a fenced instrumentation area, an unfenced support area, an airstrip, and a self-supporting lattice tower.

The interferometer is almost identical with that in the Rangehead. It has two bunkers and six radomes, [redacted] 25X1 [redacted] positioned similarly to those at the 25X1 Rangehead interferometer. The length of each leg is approximately 200 feet. The bunker located near the center of the interferometer [redacted] and is connected by 25X1 cable to the second bunker, which is in the same relative position as the second bunker at the Rangehead interferometer. The instrumentation area is enclosed by a fence measuring 1,100 by 665 feet. The area contains approximately 20 structures, including a dome with a diameter of 110 feet and a build-

ing with a 20-foot dome on its roof. The support area contains approximately 62 buildings. West of the support and instrumentation areas is an airstrip with a 6,300-foot runway. The self-supporting lattice tower, 270 feet high, is positioned 3,000 feet west of the instrumentation area, and the two are connected by ground scars.

Instrumentation Site B (Figure 28) is located at 56-57N 161-15E, 9 nm east-northeast of Yelovka and 60 nm south-southwest of Instrumentation Site A. It consists of an interferometer and an instrumentation and support area. The interferometer is similar to that in the Rangehead in that it has six radomes and two bunkers in the same relative positions. The length of each leg of the "plus" is approximately 200 feet. The instrumentation and support area contains approximately 16 structures, including a building with a 20-foot dome similar to those at the Instrumentation Control Center and at Instrumentation Site A.

Possible Instrumentation Site C (Figure 29) is located at 57-04N 161-20E, 15 nm northeast of Yelovka and approximately 10 nm north-northeast of Site B. The site contains four gable-roofed buildings and numerous unidentified objects. Five dome-shaped objects in a line probably contain instruments. A road leads to the top of a high hill on which there is a flat-roofed building.

Probable Instrumentation Site D (Figure 32) is located at 57-09N 162-48E, about 45 nm southeast of Uka. It consists of two areas about 3,000 feet apart, which contain a total of 20 buildings, several possible instruments, [redacted] Approximately 3,500 feet west of the southern area is an unidentified irregular clearing, 300 by 230 feet, connected by road with the coastal area.

25X1

Probable Instrumentation Site E (Figure 30) is located at 57-16N 162-45E, 9 nm north of Probable Instrumentation Site D. It contains 19 buildings [redacted] A building with a 20-foot dome on the roof is similar to those at the other instrumentation sites on the Kamchatka Peninsula.

25X1

25X

COMMUNICATIONS CENTER NEAR KLYUCHI

A high-frequency, long-range radio communications center was under construction in [redacted] adjacent to a densely wooded area 3,500 feet south of Klyuchi on the Kamchatka Peninsula. The center (Figure 31), located at 56-19N 160-51E, measures 4,500 by 1,700 feet overall and is composed of two separate areas. The larger, a headquarters and support area, encompasses some 25 acres and, when complete, will contain at least 39 major buildings and structures. The smaller, a communications area, has two double rhombic antenna arrays under construction; extensive clearing of wooded areas indicates possible construction of at least two more rhombic arrays. A large control building, a cooling tower, and three small buildings are also in the area.

25X1

The center is served by several unimproved roads, overhead power and/or communications lines, and a large water line. An intricate network of ditches, probably part of a water or central heating system, and linear ground scars, probably cable lines, connect various buildings and structures. Vehicle revetments, earth-mounded structures and several unidentified objects are also evident. A relatively large heliport is located approximately one nm to the west.

In size and configuration, rhombic antenna arrays A and B are nearly identical to several rhombic arrays in Communications Area A in the Rangehead. In addition to being double

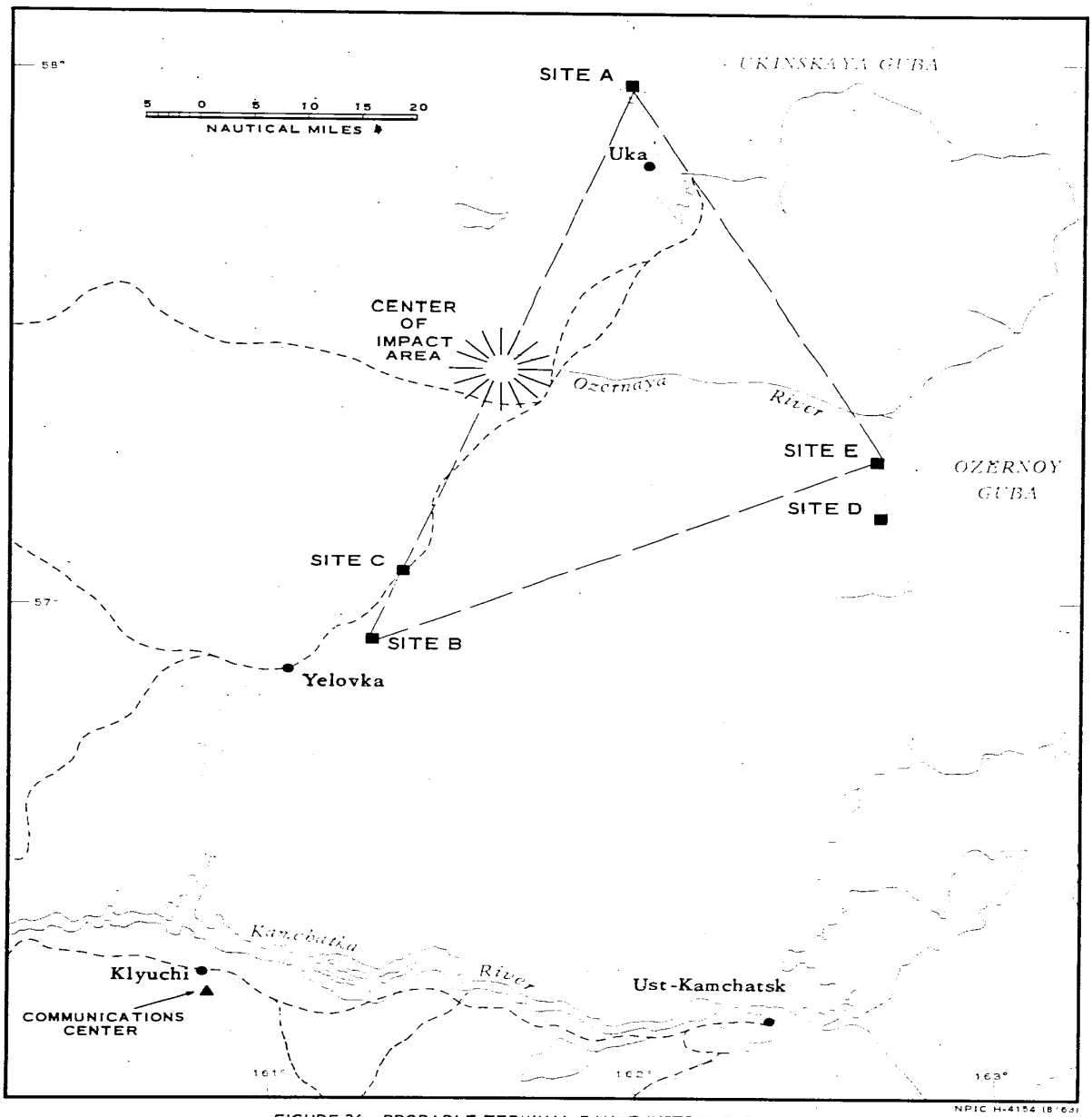


FIGURE 26. PROBABLE TERMINAL RANGE INSTRUMENTATION.

25X1

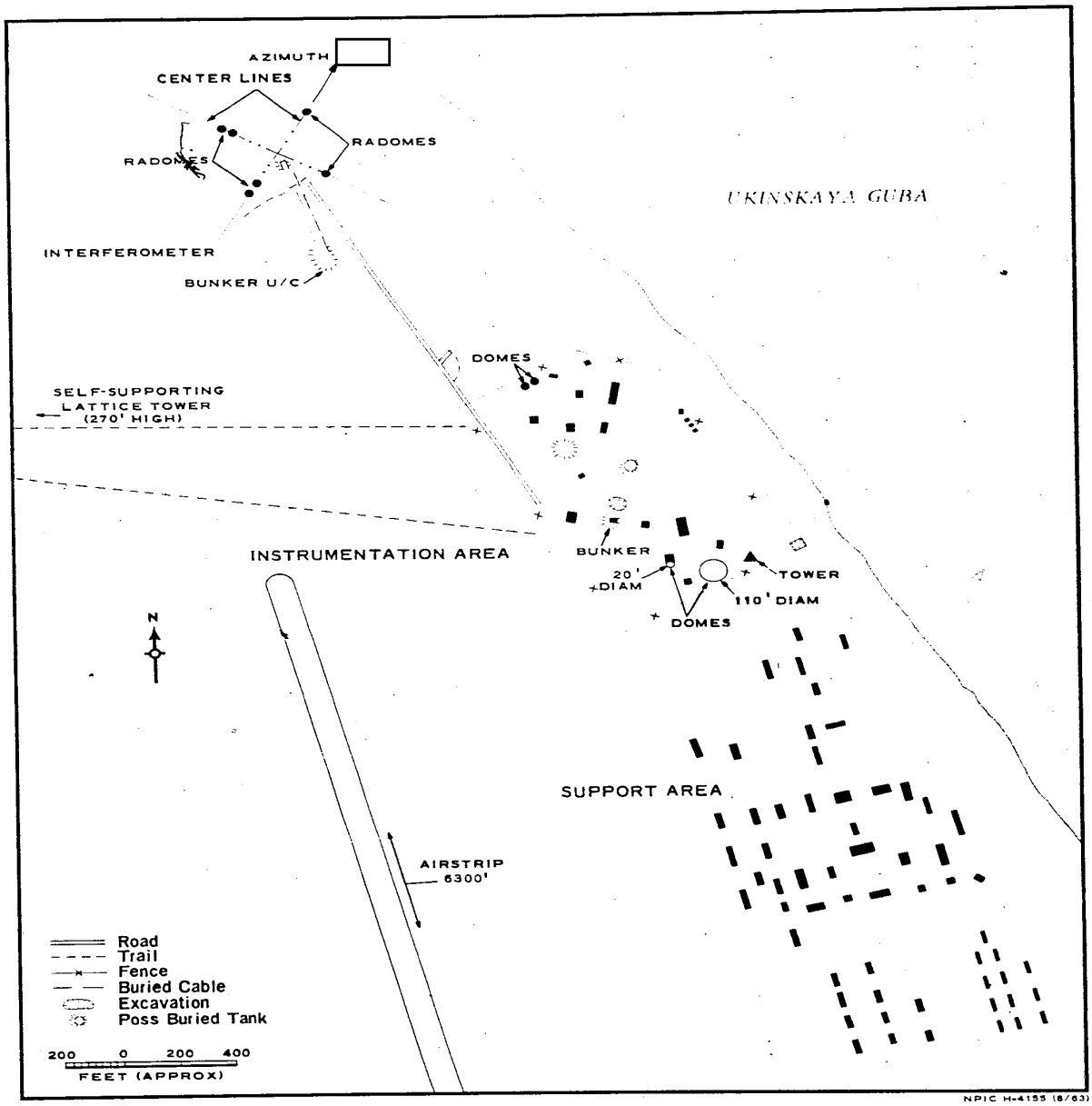


FIGURE 27. INSTRUMENTATION SITE A.

25X1

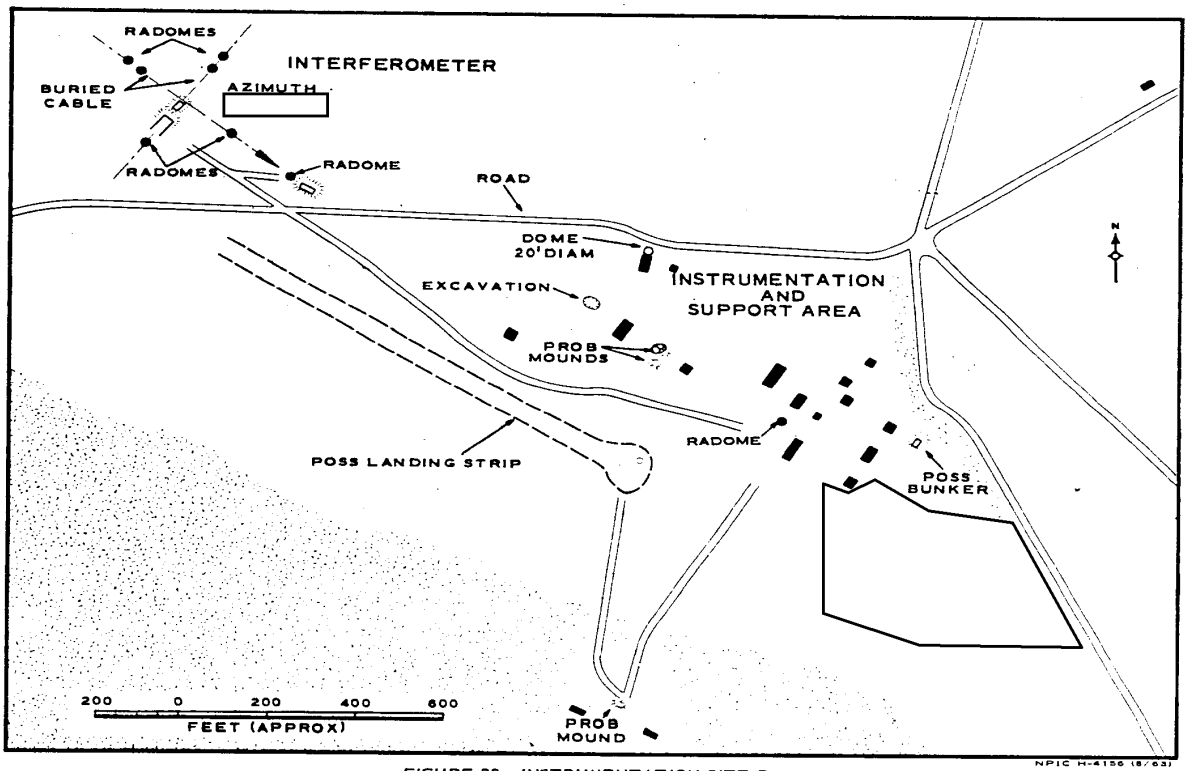


FIGURE 28. INSTRUMENTATION SITE B.

25X1

rhombics, they are oriented on an azimuth of [redacted] It is possible, therefore, that these antenna facilities, coupled with the contiguous headquarters and support area, constitute a key component of the Tyura Tam Missile Test Range.

25X1

25X1

25X1

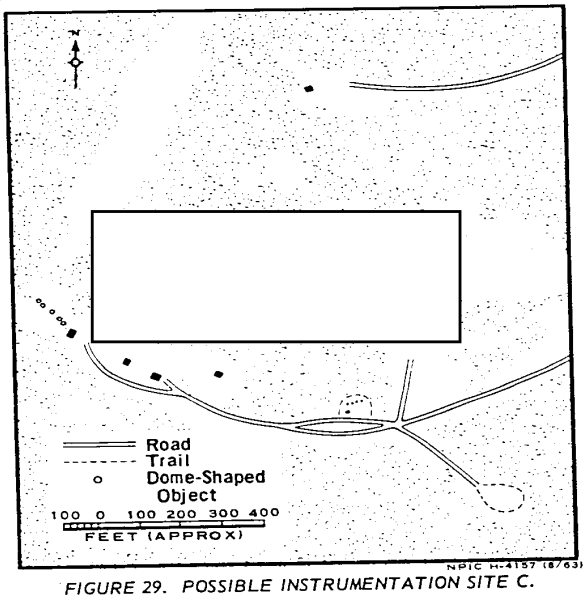


FIGURE 29. POSSIBLE INSTRUMENTATION SITE C.

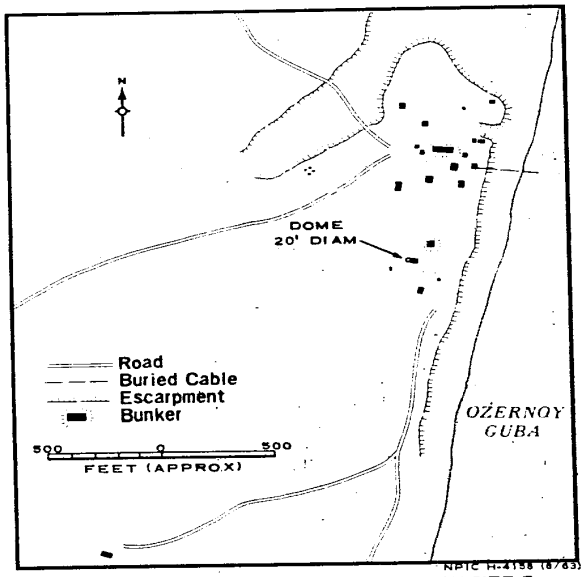


FIGURE 30. PROBABLE INSTRUMENTATION SITE E.

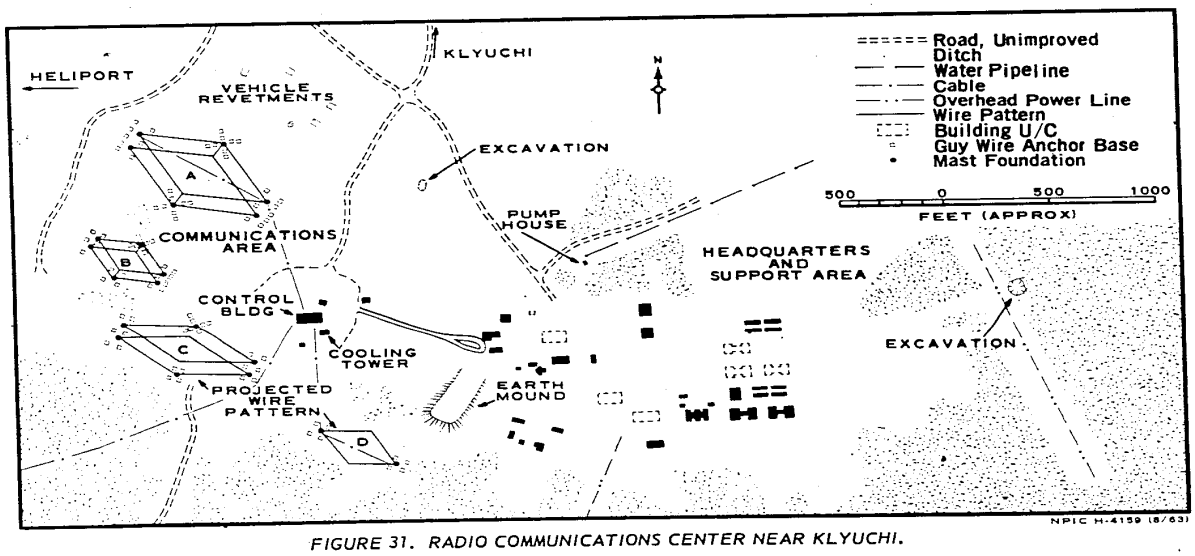


FIGURE 31. RADIO COMMUNICATIONS CENTER NEAR KLYUCHI.

25X1

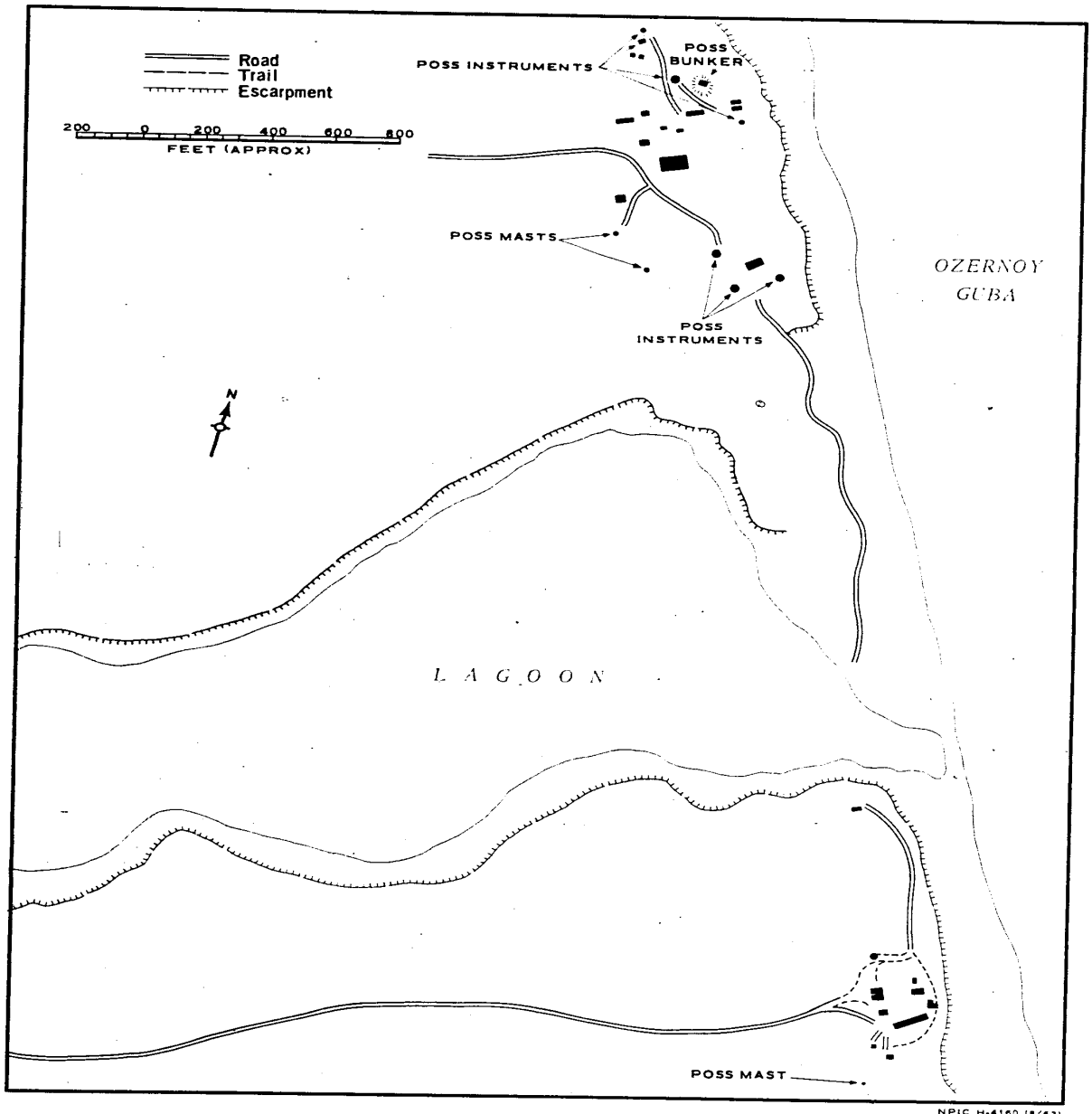


FIGURE 32. PROBABLE INSTRUMENTATION SITE D.

25X1